

Allison G. Jackson, State Bar No. 157078  
HARLAND LAW FIRM LLP  
622 H Street  
Eureka, California 95501  
(707) 444-9281 telephone  
(707) 445-2961 facsimile

Attorneys for Defendants  
KERNEN CONSTRUCTION CO.,  
BEDROCK INVESTMENTS LLC,  
SCOTT FARLEY and KURT KERNEN

UNITED STATES DISTRICT COURT  
NORTHERN DISTRICT OF CALIFORNIA

CALIFORNIANS FOR ALTERNATIVES TO  
TOXICS,

Plaintiff,

v.

KERNEN CONSTRUCTION CO.,  
BEDROCK INVESTMENTS LLC, SCOTT  
FARLEY, and KURT KERNEN,

Defendants.

Case No. 4:24-cv-04067-YGR

REQUEST FOR JUDICIAL NOTICE IN  
SUPPORT OF MOTION TO DISMISS

Date: November 12, 2024  
Time: 2:00 p.m.  
Courtroom: 1, 4th Floor  
Oakland Courthouse  
1301 Clay Street  
Oakland, CA 94612  
Judge: Honorable Yvonne Gonzalez Rogers  
Trial Date: TBD  
Action Filed: July 5, 2024

Defendants KERNEN CONSTRUCTION COMPANY, BEDROCK INVESTMENTS  
LLC, SCOTT FARLEY, and KURT KERNEN (“Defendants”), by and through their attorneys,  
hereby request that the court take judicial notice pursuant to Rule 201 of the Federal Rules of  
Evidence of the following:

1. Exhibit A: Industrial Activities Stormwater Pollution Prevention Plan; Kernen  
Construction – Glendale Yard; 2350 Glendale Drive McKinleyville, CA  
95519; WDID: 1 12I017319;
2. Exhibit B: California State Water Resources Control Board Kernen Construction  
Glendale Yard 2021-2022 Annual Report for Storm Water Discharges

Associated with Industrial Activities;

3. Exhibit C: California State Water Resources Control Board Kern Construction  
Glendale Yard 2022-2023 Annual Report for Storm Water Discharges

Associated with Industrial Activities;

4. Exhibit D: California State Water Resources Control Board Kern Construction  
Glendale Yard 2023-2024 Annual Report for Storm Water Discharges

Associated with Industrial Activities; and

5. Exhibit E: California State Water Resources Control Board Order WQ 2014-0057-  
DWQ, as Amended by Order WQ 2015-0122-DWQ & Order WQ 2018-  
DWQ – General Permit for Storm Water Discharges Associated with  
Industrial Activities.

The court may take judicial notice of facts that can be accurately and readily determined  
from sources whose accuracy cannot reasonably be questioned, including official governmental  
records.

Dated: October 2, 2024

Respectfully Submitted,  
HARLAND LAW FIRM LLP

/s/ Allison G. Jackson  
Allison G. Jackson  
Attorneys for Defendants  
KERNEN CONSTRUCTION COMPANY,  
BEDROCK INVESTMENTS LLC, SCOTT  
FARLEY, and KURT KERNEN

**EXHIBIT “A” FOLLOWS THIS PAGE**

# Industrial Activities Stormwater Pollution Prevention Plan

Kernen Construction—Glendale Yard  
2350 Glendale Drive  
McKinleyville, CA 95519  
WDID: 1 12I017319

**Prepared for:**

Kernen Construction

**February 2022**

**016181A**



**Phone:** (707) 441-8855 **Email:** [info@shn-engr.com](mailto:info@shn-engr.com)  
**Web:** [shn-engr.com](http://shn-engr.com) • 812 W. Wabash Avenue, Eureka, CA 95501-2138

# Industrial Activities Stormwater Pollution Prevention Plan

**Kernen Construction—Glendale Yard**  
**2350 Glendale Drive**  
**McKinleyville, CA 95519**  
**WDID: 1 12I017319**

Exceedance Response Action (ERA) Status: ERA Level 2

Legally Responsible Person (LRP):

Scott Farley  
Kernen Construction  
2350 Glendale Drive  
McKinleyville, CA 95519  
(707) 826-8686

Prepared for:

**Kernen Construction**

Prepared by:



812 W. Wabash Ave.  
Eureka, CA 95501-2138  
(707) 441-8855

Original SWPPP: June 29, 2015  
Current Amendment: February 2022

QA/QC: GJE\_\_\_\_  
Reference: 016181A

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## Amendment Log

Facility Name:

**KERNEN CONSTRUCTION – GLENDALE YARD**

Waste Discharge Identification (WDID):

**1 12I017319**

Amendment No.	Date	Page and Section No.	Brief Description of Amendment; include reason for change, site location, and BMP modifications.	Prepared and Approved By
1	12/2015	Page 37 Table 5.4	Sample locations 1 & 2 deleted due to run on. Sample 1 is now at drain outlet across from Fab Shop. There are now 3 Sample locations.	Bruce McIntosh
2	6/2016	Page 40 Table 5.6	Additional parameters identified by SWPPP Pollutant Source Assessment: Cu	Bruce McIntosh
3	6/2016	Page 40 Table 5.6	Nitrate and Nitrite Nitrogen removed as per conversation with Paul Keiran	Bruce McIntosh
4	9/2016	Page 40 Table 5.6	Copper removed. Not part of the parameters and no exceedances.	Bruce McIntosh
5	12/2016	Page 37 Table 5.4	Added sample location to help control water runoff. There are now back to 4 sample locations.	Bruce McIntosh
6	9/2017	Facility Site Map	New Facility Site Map	Bruce McIntosh
7	9/2017	CATs Additions	CATs Consent Agreement changes until 2/1/2020	Bruce McIntosh
8	2/2021	Through-out	Update status, drainage area descriptions, BMPs, MIP, and site map	SHN/LRP
9	2/2022	Through-out	Update drainage area descriptions, pollution prevention team and site map	SHN/LRP



## Section 1 SWPPP Requirements

### 1.1 Introduction

The Kernen Glendale Yard is located at 2350 Glendale Drive, McKinleyville, California, in the County of Humboldt. The property is owned by Bedrock Investments LLC and is being operated by Kernen Construction. The facility location is shown on the site maps in Appendix A.

This Stormwater Pollution Prevention Plan (SWPPP) is designed to comply with California's General Permit for Stormwater Discharges Associated with Industrial Activities (General Permit) Order No. 2014-0057-DWQ (NPDES No. CAS000001) and subsequent amendments issued by the State Water Resources Control Board (State Water Board). This SWPPP has been prepared following the SWPPP Template provided on the California Stormwater Quality Association Stormwater *Best Management Practice Handbook Portal: Industrial and Commercial* (CASQA 2014). In accordance with the General Permit, Section X.A, this SWPPP contains the following required elements:

- Facility Name and Contact Information
- Site Map
- List of Significant Industrial Materials
- Description of Potential Pollution Sources
- Assessment of Potential Pollutant Sources
- Minimum BMPs
- Advanced BMPs, if applicable
- Monitoring Implementation Plan (MIP)
- Annual Comprehensive Facility Compliance Evaluation (Annual Evaluation)
- Date that SWPPP was Initially Prepared and the Date of Each SWPPP Amendment, if Applicable.

### 1.2 Permit Registration Documents

Required Permit Registration Documents (PRDs) were submitted to the State Water Board via the Stormwater Multiple Application and Report Tracking System (SMARTS) by the Legally Responsible Person (LRP), or authorized personnel (that is, Approved Signatory) under the direction of the LRP. The project-specific PRDs include:

1. Notice of Intent (NOI)
2. Signed Certification Statement (LRP Certification is provided electronically with SMARTS PRD submittal)
3. Site Maps
4. SWPPP
5. Annual Fee.

The site maps can be found in Appendix A. A copy of the submitted PRDs are also kept in Appendix B of the SWPPP along with the Waste Discharge Identification (WDID) confirmation.

In the event of future significant changes to the facility layout, the Discharger will certify and submit new PRDs via SMARTS.



### 1.3 SWPPP Availability and Implementation

The SWPPP is available onsite to employees during hours of operation (see Section 2.5 for the Operations Schedule) and will be made available upon request by a State or Municipal inspector.

### 1.4 Pollution Prevention Team

Facility staff that have been designated as Pollution Prevention Team members are listed below in Table 1.1. This table will be updated as needed when there are changes to staff and staff responsibilities. Pollution prevention team members will be trained to perform the duties assigned to them. Employee training logs are provided in Appendix C. A list of responsible parties is included in Appendix D.

**Table 1.1 Pollution Prevention Team**

Name	Title	Phone Number	Responsibilities and Duties
Scott Farley	Partner	(707) 496-0699	Legally Responsible Person, SWPPP <sup>a</sup> implementation and oversight
Kurt Kernen	Partner	(707) 499-0699	BMP Review and Maintenance
Yolynn St. John	Environmental Compliance Manager	(707) 498-4912	Monitoring and reporting
Nick Randle	Operations Manager	(707) 496-6959	BMP Review and Maintenance
Mike Cardoza	Crushing Foreman	(707) 499-5692	BMP Review and Maintenance
Gwendolyn Erickson, PG	Qualified Industrial Stormwater Practitioner (QISP)	(707) 441-8855	Industrial General Permit (IGP) and SWPPP assistance, reporting as needed

<sup>a</sup> SWPPP: stormwater Pollution Prevention Plan

### 1.5 Duly Authorized Representatives

Duly Authorized Representatives who are responsible for SWPPP implementation and have authority to sign PRDs are listed below in Table 1.2.

**Table 1.2 Duly Authorized Representatives**

Name	Title	Phone Number

### 1.6 Permits and Governing Documents

In addition to the General Permit, the following documents have been taken into account while preparing this SWPPP:

- Regional Water Board
- Basin Plan
- Spill Prevention Control and Countermeasures Plan
- Hazardous Materials Business Plan



## 1.7 SWPPP Amendments

This SWPPP will be amended or revised as needed. A list of amendments (Amendment Log) is included in the front of this SWPPP, and amendment certifications are included in Appendix E. The Amendment Log will include the date of initial preparation and the date of each amendment.

The SWPPP should be revised when:

- There is a General Permit violation;
- There is a reduction or increase in the total industrial area exposed to stormwater;
- BMPs do not meet the objectives of reducing or eliminating pollutants in stormwater discharges;
- There is a change in industrial operations which may affect the discharge of pollutants to surface waters, groundwater, or a municipal separate storm sewer system (MS4);
- There is a change to the parties responsible for implementing the SWPPP; or
- Otherwise deemed necessary by the QISP.

The following items will be included in each amendment:

- Who requested the amendment;
- The location of proposed change;
- The reason for change;
- The original BMP(s) proposed, if any; and
- The new BMP(s) proposed.

The SWPPP text will be revised replaced, and/or hand annotated as necessary to properly convey the amendment. SWPPP amendments must be certified and submitted by the LRP or their designated Duly Authorized Representative via SMARTS within 30 days whenever the SWPPP contains significant revisions.

## 1.8 Retention of Records

Paper or electronic records of documents required by this SWPPP will be retained for a minimum of five (5) years from the date generated or date submitted, whichever is later, for the following items:

- Employee Training Records;
- BMP Implementation Records;
- Spill and Clean-up Related Records;
- Records of Sampling and Analysis Information
  - The date, exact location, and time of sampling or measurement;
  - The dates analyses were performed;
  - The individual that performed the analyses;
  - The analytical techniques or methods used; and
  - The results of such analyses;



- Records of Visual Observations
  - The date
  - The industrial areas/drainage areas of the facility observed during the inspection (Location);
  - The approximate time of the observation;
  - Presence and probable source of observed pollutants; and
  - Name of the individual(s) that conducted the observations;
- Response to the observations including identification of SWPPP revisions if needed. Level 1 ERA Reports;
- Level 2 ERA Action Plan;
- Level 2 ERA Technical Report; and
- Annual Reports from SMARTS (checklist and any explanations).

Copies of these records will be available for review by the Water Board's staff at the facility during scheduled facility operating hours. Upon written request by U.S. Environmental Protection Agency (EPA) or the local MS4, Dischargers will provide paper or electronic copies of requested records to the Water Boards, EPA, or local MS4 within 10 working days from receipt of the request.

## 1.9 Exceedance response actions (ERAS)

If a General Permit NAL exceedance occurs in a given reporting year, a Level 1 ERA Evaluation and a Level 1 ERA Report will be required in the following year, or, if in a subsequent year, a Level 2 ERA Action Plan and a Level 2 ERA Report will be required in accordance with the General Permit. The results of either of the ERA reports may require that the SWPPP be amended.

## 1.10 Annual Comprehensive Facility Compliance Evaluation

The General Permit (Section XV) requires the Discharger to conduct one Annual Comprehensive Facility Compliance Evaluation (Annual Evaluation) for each reporting year (July 1 to June 30). Annual Evaluations will be conducted at least 8 months and not more than 16 months after the previous Annual Evaluation. The planned window for conducting the Annual Evaluation is between April and June of each year. The SWPPP will be revised, as appropriate based on the results of the Annual Evaluation, and the revisions will be implemented within 90 days of the Annual Evaluation, as needed.

At a minimum, Annual Evaluations will consist of:

- A review of sampling, visual observation, and inspection and monitoring records and sampling and analysis results conducted during the previous reporting year;
- A visual inspection of areas of industrial activity and associated potential pollutant sources for evidence of, or the potential for, pollutants entering the stormwater conveyance system;
- A visual inspection of drainage areas previously identified as having no exposure to industrial activities and materials in accordance with the definitions in Section XVII;
- A visual inspection of equipment needed to implement the BMPs;
- A visual inspection of BMPs;



- A review and effectiveness assessment of BMPs for each area of industrial activity and associated potential pollutant sources to determine if the BMPs are properly designed, implemented, and are effective in reducing and preventing pollutants in industrial stormwater discharges and authorized NSWDS; and
- An assessment of any other factors needed to comply with the Annual Reporting requirements in General Permit Section XVI.B.

### **1.11 Annual Report**

The Annual Report will be prepared, certified, and electronically submitted no later than July 15<sup>th</sup> following each reporting year using the standardized format and checklists in SMARTS based on the reporting requirements identified in Section XVI of the General Permit. Annual reports will be submitted in SMARTS and in accordance with information required by the on-line forms.

### **1.12 Termination and Changes to general Permit Coverage**

When any of the following conditions occur, termination of coverage under the General Permit will be requested by certifying and submitting a Notice of Termination (NOT) via SMARTS:

- Operation of the facility has been transferred to another entity;
- The facility has ceased operations, completed closure activities, and removed industrial related pollutant generating sources;
- The facility's operations have changed and are no longer subject to the General Permit.

The SWPPP and provisions of the General Permit will be complied with until a valid NOT is received and accepted by the Board.

If ownership changes, the new owner of the facility will be notified of the General Permit and regulatory requirements for permit coverage.



## Section 2 Facility Information

### 2.1 Facility Description

#### 2.1.1 Facility Location

The Glendale Yard facility is located off Glendale Drive, in Humboldt County, California, approximately one mile northwest of State Highway 299 and of the City of Blue Lake. The facility is located at S/2 S2 Section 13 and NE/4 Section 24, T6N, R1E, H.B.M, latitude 40.89619°/longitude -124.00637°, and is identified on the site maps in Appendix A.

#### 2.1.2 Facility Operations

The facility consists of two separate areas: the southern upper yard and the northern lower yard (Figures 3 and 4, respectively in Appendix A). The main entrance of the facility and a majority of industrial activities occur at the southern upper yard. Industrial activities at the southern yard include storage and manufacture of rock aggregate products; crushing and sorting; storage of soil and organic debris; temporary storage of scrap roofing shingles; a truck shop; and vehicle fueling, maintenance, and cleaning. Industrial activities in the northern yard are comprised of equipment storage, and soil stockpiles. A trucking access road to the facility spans the southern perimeter of the northern yard.

Standard industrial classification codes associated with industrial activities at the facility include:

- 1429 – Crushed & Broken Stone
- 4212 – Local Trucking

#### 2.1.3 Existing Conditions

The facility comprises approximately 37 acres of which 98% is exposed to precipitation and stormwater runoff. There are no building structures at the northern yard and that portion of the facility is completely pervious. An approximately 2.5-million-gallon stormwater retention area exists along the western perimeter.

The southern yard consists of approximately 0.5 acres of cover consisting of a business office and several equipment and materials storage buildings. In addition to these structures, there is a truck scale shack that is associated with a permanent truck scale on the west side of the southern yard. The southern yard area is mostly impervious with exception to a series of sediment traps and two infiltration trenches that approximately span the southern perimeter. Stockpiles of soil and aggregate in the southern yard can account for some retention of precipitation.

Existing sources of contamination at the site include historical occurrences of small leaks of vehicle fluids, including gasoline, oil, diesel fuel, grease, petroleum products and coolants and waste absorbent materials.

#### 2.1.4 Description of Drainage Areas and Existing Drainage

##### 2.1.4.1 Regional Drainage

According to the State Water Board's ArcGIS Industrial Storm Water Map website (2020), the facility is located within the Lower Mad River Hydrologic Unit (HUC 10 ID 1801010204). In accordance with



Appendix 3 of the Industrial General Permit, there are no impairments listed for this watershed. In general, stormwater discharges from the facility discharge both directly and indirectly to Hall Creek, a tributary to Lower Mad River.

#### **2.1.4.2 Description of Existing Site Drainage Areas**

The facility is on a lower terrace of the Mad River. The elevation of the project site ranges from 80-100 feet above mean sea level (msl).

Both the northern and southern yards of the facility are relatively level, but the southern yard sits topographically above the northern yard by approximately 20 feet. Stormwater drainage on both yards generally flows to the south southwest. A description of drainage at each yard is presented below.

Stormwater discharges from the southern yard have been significantly limited by the installation of an infiltration network spanning the southeast and southern perimeter. The infiltration network is approximately 1,000 feet long and comprises two separate trenches that nearly meet north and east of former discharge location SL-2 (See Figure 3 in Appendix A). The trenches are backfilled with gravel and remain pervious on the surface. Sediment traps that were formerly discharge locations and new settling traps located west of the storage building at the facility have been plumbed to drain into the infiltration trenches. If the sediment traps become full, the water will be pumped out and placed in the stormwater retention area located in the northern yard. The locations and sizes of the existing sediment traps coincided with already low areas along the southern yard boundary and allowed space given the constraints of materials storage operations. The traps were not formerly designed. If during the course of a historically significant wet season, the infiltration trenches were to reach capacity, stormwater would backflow into the sediment traps. Although the discharge pipes from the traps have been plugged, if a storm event overwhelmed the system discharge would occur from the sediment traps. Former discharge locations from the southern yard are now observation locations.

Stormwater drainage in the northern yard typically flows to the south, and collects in a stormwater retention area located along the southern perimeter of the yard. Water from the retention feature will be used to water the yard for dust suppression. A large soil stockpile that is mostly vegetated exists in the southern portion of this yard. Vegetated swales with small earthen sediment traps and rock check dams have been constructed on the east, north, and west sides of the stockpile. The earthen and rock check dams promote some amount of infiltration and sediment settling. A drainage ditch adjacent to the facility access road exists along the southern side of the stockpile. This drainage ditch includes terraced basins to promote infiltration and settling of sediment as well. Stormwater from the northern yard is captured in one of the vegetated swales. The northern yard is shown on Figure 4 in Appendix A.

#### **2.1.5 Stormwater Run-On from Offsite Areas**

The General Permit requires that BMPs be implemented to direct offsite and non-industrial run-on away from industrial areas and erodible surfaces. Runon use to enter the southern yard facility near the eastern equipment storage area along Glendale Drive. The facility has installed a culvert that conveys the stormwater by way of an underground pipe from the road to the open field to the south. Consequently, stormwater runon does not affect industrial activities at the site.





### **2.1.6 Geology and Groundwater**

The site has natural soils on the project area that have a loamy texture. The gravel surface on the North Yard area has a sand/gravel texture. The erosion hazard for this area is very low due to the flat topography and permeability of the soils.

## **2.2 Operations Schedule**

The Glendale Yard facility operates Monday through Friday 7 a.m. to 5 p.m. Variations in actual operating hours may occur, as necessary. Depending on demand, the yard may be open outside of these operating hours.

A copy of this SWPPP is available for review by facility personnel during operational hours. A copy will be available to regulatory agency personnel upon request.

If industrial activities are temporarily suspended for 10 or more consecutive calendar days during a reporting year, BMPs that are necessary to achieve compliance with this General Permit during the temporary suspension of the industrial activity will be identified and incorporated into the SWPPP.

## **2.3 Pollutant Source Assessment**

This section presents an assessment of industrial materials/operations/activities and potential pollutant sources at the Glendale Yard facility. It identifies specific pollutants associated with industrial operations and pollutant sources that are most susceptible to stormwater exposure.

### **2.3.1 Description of Potential Pollutant Sources**

Table 2.1 includes a list of industrial activities and associated materials that are anticipated to be used onsite. These activities and associated materials will or could potentially contribute pollutants to stormwater runoff. The anticipated activities and associated pollutants provided in Table 2.1 are the basis for selecting the BMPs for the facility as described in Section 3. Locations of material stockpiles, storage areas, anticipated pollutants, and associated BMPs are shown on the site maps in Appendix A.



**Table 2.1 Summary Assessment of Potential Pollutant Sources and Corresponding BMPs<sup>a</sup>**

Operational Area	Primary Activities	Potential Pollution Sources	Potential Pollutants
Entrances, internal access roads and materials stockpiles (Northern and Southern Yards)	<ul style="list-style-type: none"> <li>• Vehicle and truck traffic and parking, loading and unloading products and byproducts</li> </ul>	<ul style="list-style-type: none"> <li>• Debris, and particulate matter from vehicles and equipment</li> <li>• Incidental spills and leaks from equipment and trucks</li> <li>• Soil/Materials stockpiles</li> </ul>	<ul style="list-style-type: none"> <li>• Debris and soil, tire, and exhaust gas particulates</li> <li>• Petroleum hydrocarbons and other automotive fluids</li> <li>• Sediment</li> <li>• Metals including iron and aluminum</li> </ul>
Fabrication Shop (Southern Yard)	<ul style="list-style-type: none"> <li>• Millwrights repairing and constructing, welding</li> </ul>	<ul style="list-style-type: none"> <li>• Machinery and maintenance operations, welding, cutting, grinding, and filing</li> </ul>	<ul style="list-style-type: none"> <li>• Cutting oils, solvents, gear and lube oil, and waste fluids</li> <li>• Wear metals including iron and aluminum</li> </ul>
Maintenance Shop, Fueling Area, Wash rack	<ul style="list-style-type: none"> <li>• Vehicle and equipment servicing and repair</li> <li>• Fuel storage and filling and fueling operations</li> <li>• Vehicle and equipment washing</li> </ul>	<ul style="list-style-type: none"> <li>• Leaks and spills during maintenance operations and from equipment awaiting maintenance</li> <li>• Leaks and spills from AST<sup>b</sup> and transfer systems or operations</li> <li>• Wash water/rinseate</li> </ul>	<ul style="list-style-type: none"> <li>• Waste materials, such as used filters, waste batteries, solvents, used oil, anti-freeze, and waste fluids</li> <li>• Grease and oil, petrochemicals, and other fluids</li> </ul>

<sup>a</sup> BMPs: best management practices<sup>b</sup> AST: aboveground storage tank

### 2.3.2 Significant Spills and Leaks

Table 2.2 includes a list of industrial materials where spills and leaks have potential to occur, and includes material characteristics, quantities, locations, and containers. Spills and leaks will be prevented by implementing the BMPs described in Section 3.

**Table 2.2 Potential Material Spills and Leaks**

Industrial Material	Material Physical Characteristics	Material Quantity	Material Container	Material Location
Unleaded gasoline	Liquid	800 gallons	AST <sup>a</sup>	Fuel Storage Area
Diesel	Liquid	4700 gallons	AST	Fuel Storage Area
Diesel #2	Liquid	9000 gallons	AST	Fuel Storage Area
Waste Oil	Liquid	800 gallons	AST	Truck Shop
Lubricants/ AntiFreeze	Liquid	Varies	55-gallon drums	Truck Shop
Engine Oil	Liquid	250 gallons	AST	Truck Shop

<sup>a</sup> AST: aboveground storage tank

## 2.4 Identification of Non-Stormwater Discharges (NSWDS)

Non-stormwater discharges (NSWDs) consist of discharges which do not originate from precipitation events. The General Permit provides allowances for specified NSWDS provided they:

- Do not cause erosion;
- Do not carry other pollutants;
- Are not prohibited by the local MS4; and
- Do not require a separate NPDES Permit from the Regional Water Board.

NSWDs into storm drainage systems or waterways, which are not authorized under the General Permit and listed in the SWPPP, or authorized under a separate NPDES permit, are prohibited.

NSWDs will be managed with the stormwater and non-stormwater BMPs described in Section 3 of this SWPPP. These BMPs are implemented to:

- Reduce or prevent the contact of authorized NSWDS with materials or equipment that are potential sources of pollutants;
- Reduce, to the extent practicable, the flow or volume of authorized NSWDS;
- Ensure that authorized NSWDS do not contain quantities of pollutants that cause or contribute to an exceedance of a water quality standards; and
- Reduce or prevent discharges of pollutants in authorized NSWDS in a manner that reflects best industry practice considering technological availability and economic practicability and achievability.



Monthly visual observations will be conducted according to the General Permit (Section XI.A.1) for NSWDS and sources to ensure adequate BMP implementation and effectiveness. Monthly visual observations include observations for evidence of unauthorized NSWDS.

Steps will be taken, including the implementation of appropriate BMPs as defined in Section 3, to ensure that unauthorized NSWDS are eliminated, controlled, disposed offsite, or treated onsite.

The wash rack is plumbed to an oil-water separator prior to discharge to the sanitary sewer.

## 2.5 Required Site Map Information

The facility's site maps are provided in Appendix A and include information required by the General Permit.

A summary of information provided in the site maps is provided in Table 2.3 below.

**Table 2.3 Required Site Maps Information Checklist**

Included on Site Maps? Yes/No/NA <sup>a</sup>	Required Element
Yes	The facility boundary
Yes	Stormwater drainage areas within the facility boundary
Yes	Portions of any drainage area impacted by discharges from surrounding areas
Yes	Flow direction of each drainage area
NA	On-facility surface water bodies
Yes	Areas of soil erosion
Yes	Location(s) of nearby water bodies (such as rivers, lakes, wetlands, and so on)
Yes	Location(s) of municipal storm drain inlets that may receive the facility's industrial stormwater discharges and authorized NSWDS <sup>b</sup>
Yes	Locations of stormwater collection and conveyance systems and associated points of discharge, and direction of flow
Yes	Any structural control measures (that affect industrial stormwater discharges, authorized NSWDS, and run-on)
Yes	All impervious areas of the facility, including paved areas, buildings, covered storage areas, or other roofed structures
Yes	Locations where materials are directly exposed to precipitation
NA	Locations where significant spills or leaks (Section X.G.1.d of the General Permit) have occurred
Yes	Areas of industrial activity subject to the General Permit
Yes	All storage areas and storage tanks
Yes	Shipping and receiving areas
Yes	Fueling areas
Yes	Vehicle and equipment storage/maintenance areas



**Table 2.3 Required Site Maps Information Checklist**

<b>Included on Site Maps? Yes/No/NA<sup>a</sup></b>	<b>Required Element</b>
Yes	Material handling and processing areas
Yes	Waste treatment and disposal areas
Yes	Dust or particulate generating areas
Yes	Cleaning and material reuse areas
NA	Any other areas of industrial activity which may have potential pollutant sources

<sup>a</sup> NA: not applicable<sup>b</sup> NSWDS: non-stormwater discharges

## Section 3 Best Management Practices

### 3.1 Minimum BMPs

Minimum BMPs that are required by the General Permit and necessary to meet the facility conditions will be implemented. Guidance for BMP implementation is provided in the CASQA Stormwater BMP Handbook Portal: Industrial and Commercial Fact Sheets and the relevant fact sheets are included in Appendix F. Sections 3.1.1 through 3.1.5 list the requirements for each of these minimum BMPs. Minimum BMPs will be implemented for additional targeted industrial activities, equipment, and materials as necessary. Minimum BMPs will be implemented as practical for the facility's operations.

Table 3.1 provides a list of the five minimum General Permit BMP elements that are included in the relevant BMP fact sheets and indicates which BMPs are implemented at the facility. Employee Training, described in Section 3.1.6, and Quality Assurance and Record Keeping, described in Section 3.1.7, are additional minimum BMPs that will be implemented.

As required by the General Permit, a summary of implemented BMPs is included in Section 3.3. The schedule for BMP implementation and the requirements for inspection and maintenance are contained in Section 4.



**Table 3.1 Minimum BMPs<sup>a</sup>**

CASQA <sup>b</sup> Fact Sheet Number	CASQA BMP Fact Sheet Name	Addresses Minimum General Permit BMP Requirements					BMP to be Implemented?		
		Good House-keeping	Preventative Maintenance	Spill and Leak Prevention and Response	Material Handling and Waste Management	Erosion and Sediment Control	YES	NO	Not Applicable
SC-10	Non-Stormwater Discharges	✓		✓			X		
SC-11	Spill Prevention, Control, and Cleanup			✓			X		
SC-20	Vehicle and Equipment Fueling	✓	✓	✓	✓		X		
SC-21	Vehicle and Equipment Cleaning	✓	✓	✓	✓		X		
SC-22	Vehicle and Equipment Maintenance and Repair	✓	✓	✓	✓		X		
SC-30	Outdoor Loading and Unloading	✓		✓	✓		X		
SC-31	Outdoor Liquid Container Storage	✓	✓	✓	✓		X		
SC-32	Outdoor Equipment Operations	✓	✓	✓	✓		X		
SC-33	Outdoor Storage of Raw Materials	✓	✓	✓		✓	X		
SC-34	Waste Handling and Disposal	✓	✓	✓	✓		X		
SC-35	Safer Alternative Products								X
SC-40	Contaminated or Erodible Surfaces					✓	X		
SC-41	Building and Grounds Maintenance	✓		✓	✓		X		
SC-42	Building Repair, Remodeling, and Construction	✓		✓	✓	✓		X	
SC-43	Parking Area Maintenance	✓	✓	✓				X	
SC-44	Drainage System Maintenance	✓	✓	✓			X		

<sup>a</sup> BMP: best management practice<sup>b</sup> CASQA: California Stormwater Quality Association

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### 3.1.1 Good Housekeeping

The following good housekeeping measures will be implemented in accordance with the General Permit (Section X.H.1.a):

- Observe outdoor areas associated with industrial activity including stormwater discharge locations, drainage areas, conveyance systems, waste handling/disposal areas, and perimeter areas impacted by off-facility materials or stormwater run-on to determine housekeeping needs. Any identified debris, waste, spills, tracked materials, or leaked materials will be cleaned and disposed of properly;
- Minimize or prevent material tracking;
- Minimize dust generated from industrial materials or activities;
- Ensure that facility areas impacted by rinse/wash waters are cleaned as soon as possible;
- Cover, as practical, stored industrial materials that can be readily mobilized by contact with stormwater;
- Contain, as practical, stored non-solid industrial materials or wastes (e.g., particulates, powders, shredded paper, etc.) that can be transported or dispersed via by the wind or contact with stormwater;
- Prevent disposal of rinse/wash waters or industrial materials into the stormwater conveyance system;
- Minimize stormwater discharges from non-industrial areas (for example, stormwater flows from employee parking area) that contact industrial areas of the facility; and
- Minimize authorized NSWDs from non-industrial areas (for example, potable water, fire hydrant testing, and so on) that contact industrial areas of the facility.

BMPs to be implemented are summarized in Table 3.1 and the BMP fact sheets are included in Appendix F.

### 3.1.2 Preventative Maintenance

The following preventative maintenance measures will be implemented in accordance with the General Permit (Section X.H.1.b):

- Identify equipment and systems used outdoors that may spill or leak pollutants;
- Observe the identified equipment and systems to detect leaks, or identify conditions that may result in the development of leaks;
- Establish an appropriate schedule for maintenance of identified equipment and systems; and
- Establish procedures for prompt maintenance and repair of equipment, and maintenance of systems when conditions exist that may result in the development of spills or leaks.

Specific preventative maintenance BMPs to be implemented at the facility are provided in Table 3.1 and the BMP fact sheets are included in Appendix F.





### 3.1.3 Spill and Leak Prevention and Response

The following spill and leak prevention and response measures will be implemented in accordance with the General Permit (Section X.H.1.c):

- Establish procedures and/or controls to minimize spills and leaks;
- Develop and implement spill and leak response procedures to prevent industrial materials from discharging through the stormwater conveyance system. Spilled or leaked industrial materials will be cleaned promptly and disposed of properly;
- Identify and describe necessary and appropriate spill and leak response equipment, location(s) of spill and leak response equipment, and spill or leak response equipment maintenance procedures; and
- Identify and train appropriate spill and leak response personnel.

Specific spill and leak prevention and response BMPs to be implemented are provided in Table 3.1 and the BMP fact sheets are included in Appendix F.

#### 3.1.3.1 Minor Spills

If a minor spill of petroleum or antifreeze materials occurs, the following practices shall be implemented:

- The spill shall be contained onsite.
- If the spill occurs on a paved or impermeable surface, clean-up shall be by using “dry methods,” such as absorbent materials, or rags.
- If the spill occurs on dirt or porous areas, the spill shall be contained by constructing a dike. Contaminated soil shall be excavated, removed from the site and disposed of at an appropriate site.
- If a minor spill occurs during a rain event, the spill area shall be covered to prevent runoff.
- Steps to contain minor spills shall be recorded.

#### 3.1.3.2. Major Spills

- No major spills are likely to occur due to the type of operations to be conducted on this project site. If, however, a major spill does occur, onsite personnel shall not attempt to control the spill but shall contact the Humboldt County Office of Environmental Health (707) 445-6515.
- In addition, the Governor’s Office of Emergency Services Warning Center shall be noticed at (800) 852-7550. A written report of the incident shall be sent to notified authorities, if requested.

### 3.1.4 Material Handling and Waste Management

The following material handling and waste management measures will be implemented in accordance with the General Permit (Section X.H.1.d):

- Prevent or minimize handling of industrial materials or wastes that can be readily mobilized by contact with stormwater during a storm event;



- Contain stored non-solid industrial materials or wastes (for example, particulates, powders, shredded paper, and so on) that can be transported or dispersed by the wind or contact with stormwater during handling;
- Cover industrial waste disposal containers and industrial material storage containers that contain industrial materials when not in use;
- Divert run-on and stormwater generated from within the facility away from stockpiled materials;
- Clean spills of industrial materials or wastes that occur during handling in accordance with the spill response procedures (Section X.H.1.c); and
- Observe and clean as appropriate, any outdoor material or waste handling equipment or containers that can be contaminated by contact with industrial materials or wastes.

Specific material handling and waste management BMPs to be implemented are provided in Table 3.1 and the BMP fact sheets are included in Appendix F.

### 3.1.5 Erosion and Sediment Controls

The following erosion and sediment control measures will be implemented in accordance with the General Permit (Section X.H.1.e):

- Implement effective wind erosion controls;
- Provide effective stabilization for all disturbed soils and other erodible areas prior to a forecasted storm event;
- Maintain effective perimeter controls and stabilize site entrances and exits to sufficiently control discharges of erodible materials from discharging or being tracked off the site;
- Divert run-on and stormwater generated from within the facility away from erodible materials; and
- If sediment basins are implemented, ensure compliance with the design storm standards in Section X.H.6. of the General Permit.

Specific erosion and sediment control BMPs to be implemented are provided in Table 3.1 and the BMP fact sheets are included in Appendix F.

### 3.1.6 Employee Training Program

An employee training program will be implemented in accordance with the following requirements in the General Permit (Section X.H.1.f):

- Ensure that team members implementing the various compliance activities of this SWPPP are properly trained in topics including but not limited to: BMP implementation, BMP effectiveness evaluations, visual observations, and monitoring activities.
- Prepare or acquire appropriate training manuals or training materials.
- Identify which personnel need to be trained, their responsibilities, and the type of training they will receive.
- Provide a training schedule.



- Maintain documentation of all completed training classes and the personnel that received training in the SWPPP.

The Pollution Prevention Team will be trained in implementing the various compliance activities specified in this SWPPP, and documentation of training activities is retained in SWPPP Appendix C. To promote stormwater management awareness specific for this facility, refresher training will be provided yearly.

Task specific training for employees engaged in activities that have the potential to cause stormwater pollution will be conducted when new employees are hired, and refresher training will be provided yearly.

If the facility moves from baseline level, a QISP will be responsible for providing training. The QISP will be required to provide information during training sessions and subsequently completing the training logs shown in Appendix C. The training log identifies the site-specific stormwater topics covered as well as the names of site personnel who attended the meeting. Each team member will be trained in the specific role they are responsible to undertake.

### **3.1.7 Quality Assurance and Record Keeping**

The following quality assurance and record keeping activities will be performed in accordance with the requirements in the General Permit (Section X.H.1.g):

- Develop and implement management procedures to ensure that appropriate staff implements all elements of the SWPPP, including the Monitoring Implementation Plan (SWPPP Section 5).
- Develop a method of tracking and recording the implementation of BMPs identified in the SWPPP.
- Maintain the BMP implementation records, training records, and records related to any spills and clean-up related response activities for a minimum of 5 years as required in the General Permit (Section XXI.J.4).

BMPs will be implemented according to the schedule and procedures presented in SWPPP Section 4. BMPs will be implemented by properly trained team members as documented in Appendix C.

Visual observations will be performed as described in SWPPP Section 5.5. Potential pollutant sources and BMPs will be inspected during visual observations, and new BMPs will be implemented as needed. Records of visual observations of BMP implementation will be retained in Appendix G.

Visual inspections shall document the presence of any floating and suspended material, oil, grease, discolorations, turbidity, odor, and source of any pollutants.

Paper or electronic records of documents required by this SWPPP will be retained for a minimum of 5 years from the date generated or date submitted, whichever is later, for the following items:

- Employee Training Records
- BMP Implementation Records
- Spill and Clean-up Related Records
- Records of Monitoring Information
  - The date exact location and time of sampling or measurement



- The date(s) analyses were performed
- The individual(s) that performed the analyses
- The analytical techniques or methods used and
- The results of such analyses
- Level 1 ERA Reports
- Level 2 ERA Action Plan
- Level 2 ERA Technical Report and
- Annual Reports

## 3.2 Advanced BMPs

In addition to the minimum BMPs described in Section 3.1, advanced BMPs, if needed to reduce or prevent discharges of pollutants in stormwater discharges, will be implemented to the extent feasible considering technological availability and economic practicability and achievability. Advanced BMPs will be implemented for targeted industrial activities, equipment, and materials as necessary. As required by the General Permit, a summary of implemented advanced BMPs is included herein.

### 3.2.1 Exposure Minimization BMPs

Storm resistant shelters are installed onsite to prevent the contact of stormwater with industrial activities and material. The locations of these shelters and associated industrial activities and materials are presented in Table 3.2.

**Table 3.2 Exposure Minimization BMPs**

Shelter Location/Description	Associated Industrial Activity/Material
Storage building southeast corner Southern Yard	Storage of parts and equipment
Storage buildings northeast corner Southern Yard	Storage of parts and equipment
Fabrication Shop in Southern Yard	Welding, equipment fabrication and repair
Maintenance Shop	Truck and equipment maintenance and repair
AST <sup>a</sup> cover	Fueling and Fuel storage

<sup>a</sup> AST: aboveground storage tank

### 3.2.2 Stormwater Containment and Discharge Reduction BMPs

Stormwater containment and discharge reduction BMPs include BMPs that divert, reuse, contain, or reduce the volume of stormwater runoff. Specific stormwater containment and discharge reduction BMPs to be implemented at the Glendale Yard facility are provided in Table 3.3 and the BMP fact sheets are included in Appendix F.

## 3.3 BMP Summary Table

Table 3.4 summarizes the industrial activities, materials, pollutant sources, potential pollutants, and BMPs being implemented to prevent discharge of pollutants in stormwater runoff. Descriptions of the specific BMPs being implemented were provided in previous subsections. Implementation and maintenance of BMPs is described in Section 4.



**Table 3.3 Stormwater Containment and Discharge Reduction BMPs<sup>a</sup>**

CASQA <sup>b</sup> Fact Sheet Number	CASQA BMP Factsheet Name	Meets Advanced BMP Requirement	BMP Used		BMP Location, Runoff Sources, and Potential Pollutants
			YES	NO	
TC-10	Infiltration Trench	✓	x		Southern yard south perimeter
TC-11	Infiltration Basin	✓	x		Sediment traps in southern yard
TC-12	Harvest and Reuse	✓		x	
TC-20	Wet Pond	✓		x	
TC-21	Constructed Wetland	✓		x	
TC-22	Extended Detention Basin	✓		x	
TC-30	Vegetated Swale		x		Northern yard
TC-31	Vegetated Buffer Strip		x		Northern yard
TC-32	Bioretention	✓		x	
TC-40	Media Filter			x	
TC-50	Water Quality Inlet			x	
TC-60	Multiple Systems	✓		x	
MP-20	Biotreatment			x	
MP-40	Stormwater Filter			x	
MP-50	Wet Vault			x	
MP-51	Gravity Separator			x	
MP-52	Drain Inlet Insert			x	
<b>Alternate BMPs Used:</b>					<b>If used, state reason:</b>

<sup>a</sup> BMPs: best management practices<sup>b</sup> CASQA: California Stormwater Quality Association

**Table 3.4 BMP<sup>a</sup> Summary**

<b>Industrial Activity/ Drainage Area</b>	<b>BMPs</b>	<b>Person Responsible for Implementing/Overseeing BMP</b>	<b>Frequency of Implementation</b>
Wash rack, Maintenance Shop and Fueling, HMBP <sup>b</sup> /SPCC <sup>c</sup> liquids storage	Non-Stormwater Discharges	Operations Manager/Shop Superintendent/Partner	Daily
	Spill Prevention, Control, and Cleanup		Daily
	Vehicle and Equipment Fueling		Daily
	Vehicle and Equipment Cleaning		Daily
	Vehicle and Equipment Maintenance and Repair		Daily
	Outdoor Liquid Container Storage		As needed
Southern Yard and Northern Yard	Outdoor Loading and Unloading	Operations Manager/Crushing Foreman/Partner	Daily
	Outdoor Equipment Operations		As needed
	Outdoor Storage of Raw Materials		As needed
	Drainage System Maintenance	Operations Manager/Partner	As needed
	Building and Grounds Maintenance	Operations Manager/Partner	As needed
Northern Yard	Contaminated or Erodible Surfaces	Operations Manager/Partner	As needed
	Vegetated Swale		As needed
Southern Yard	Waste Handling and Disposal	Environmental Compliance Manager/Shop Superintendent/Partner	Daily
	Infiltration Trench	Operations Manager/Partner	As needed
	Infiltration Basin (Settling basins)	Operations Manager/Partner	As needed

<sup>a</sup> BMP: best management practice<sup>b</sup> HMBP: Hazardous Materials Business Plan<sup>c</sup> SPCC: Spill Prevention, Control, and Countermeasure

## **Section 4 BMP Implementation**

### **4.1 BMP Implementation Schedule**

The schedule for implementing minimum and advanced BMPs is presented in Table 3.4. BMPs will be implemented as necessary to reduce or prevent transport of industrial pollutants in stormwater runoff. Slight modifications to this schedule may be necessary to achieve this goal.

### **4.2 BMP Inspection and Maintenance**

The General Permit requires, at a minimum, monthly observations of BMPs, along with inspections during sampling events. Monthly observations will be conducted during daylight hours of scheduled facility operating hours and on days without precipitation. A BMP observation checklist must be filled out for and maintained on-site with the SWPPP. The observation checklist includes the necessary information as discussed in Section 5.5. A blank observation checklist can be found in Appendix G, and completed checklists will be kept in an accompanying file/binder and readily accessible onsite.

BMPs will be maintained regularly to ensure proper and effective functionality. If necessary, corrective actions will be implemented within 72 hours of identified deficiencies and associated amendments to the SWPPP will be prepared and documented.



## Section 5 Monitoring Implementation Plan

### 5.1 Purpose

This Monitoring Implementation Plan was developed to address the following objectives:

1. Identify the monitoring team;
2. Describe weather and rain event tracking procedures;
3. Describe discharge locations, visual observations procedures
4. Describe visual observation response procedures;
5. Describe sample collection and handling procedures;
6. Describe field instrumentation calibration instructions and intervals;
7. Provide justification for alternative discharge locations, Representative Sample Reduction (RSR), and Qualified Combined Samples (QCS), as applicable; and
8. Provide an example Chain of Custody form to be used when handling and shipping water quality samples to the laboratory.

### 5.2 Weather and Rain Event Tracking

Stormwater sampling and visual observations will be conducted during Qualified Storm Events (QSEs). A QSE is defined as any precipitation event that produces a discharge for at least one drainage area and is preceded by 48 hours with no discharge from any drainage area. Weather and precipitation forecasts will be tracked to identify potential QSEs.

When targeting a QSE for stormwater sampling, the appropriate team member will weekly consult the National Oceanographic and Atmospheric Administration (NOAA) for weather forecasts. These forecasts can be obtained at <http://www.srh.noaa.gov/>. If weekly forecasts indicate potential for significant precipitation, the weather forecast will be closely monitored during the 48 hours preceding the event. Weather reports with precipitation data shall be printed and maintained with the relevant inspections records in a separate folder on site.

### 5.3 Monitoring Locations

Monitoring locations are shown on the site maps in Appendix A. Monitoring locations are described in Section 5.6.

Whenever changes in facility operations might affect the appropriateness of sampling locations, the sampling locations will be revised accordingly. Such revisions will be implemented as soon as feasible and the SWPPP amended.

### 5.4 Sample Collection and Visual Observation Exceptions

The collection of samples or conduct visual observations is not required under the following conditions:

- During dangerous weather conditions such as flooding and electrical storms.
- Outside of scheduled site business hours.





Scheduled site business hours are presented in Section 2.2.

If monitoring (visual observations or sample collection) of the site is unsafe because of the dangerous conditions noted above, then the appropriate team member will document the conditions for why an exception to performing the monitoring was necessary. The exception documentation will be filed in the completed forms stored in a separate binder on site.

## 5.5 Visual Observation Procedures

Visual monitoring includes observations of drainage areas, BMPs, and discharge locations.

- Observations of BMPs are required to identify and record BMPs that need maintenance to operate effectively, that have failed, or that could fail to operate as intended.
- Observations of the drainage areas are required to identify any spills, leaks, uncontrolled pollutant sources, and non-stormwater discharges.
- Observations of discharge locations are required to identify the presence of visible pollutants in stormwater discharged from the facility.

Visual observations will be performed at least once every calendar month during dry conditions. Visual observations will also be performed during stormwater sampling events when discharge is occurring.

### 5.5.1 Monthly Visual Observations

Monthly visual observations are necessary to document the presence of and to identify the source of pollutants and non-stormwater flows. These should consist of observations of the outdoor facility operations, BMPs, and NSWSD observations.

In the event that monthly visual observations are not performed, an explanation must be provided in the annual report.

#### 5.5.1.1 Outdoor Facility Operations Observations

Observe potential sources of industrial pollutants including industrial equipment and storage areas, and outdoor industrial activities. Record observations of:

- Spills or leaks; and
- Uncontrolled pollutant sources

#### 5.5.1.2 BMP Observations

Observe BMPs to identify and record:

- BMPs that are properly implemented;
- BMPs that need maintenance to operate effectively;
- BMPs that have failed; or
- BMPs that could fail to operate as intended.

#### 5.5.1.3 Non-Stormwater Discharge Observations

Observe each drainage area for the presence of or indications of prior unauthorized and authorized non-stormwater discharges.



Record:

- Presence or evidence of NSW (authorized or unauthorized)
- Pollutant characteristics (floating and suspended material, sheen, discoloration, turbidity, odor, and so on)
- Source of discharge

For authorized NSW, also document whether BMPs are in place and are functioning to prevent contact with materials or equipment that could introduce pollutants

### 5.5.2 Sampling Event Visual Observations

Sampling event visual observations evaluate the general appearance of the stormwater as an indicator of potential pollutants. These observations will be conducted at the same time sampling occurs at the discharge locations identified in Section 5.6.2. At each discharge location where a sample is obtained, record observations of:

- Floating and suspended materials
- Oil and grease
- Discoloration
- Turbidity
- Odors
- Trash

When pollutants are observed in the discharged stormwater, follow-up observations of the drainage area will be conducted to identify the probable source of the pollutants.

In the event that a discharge location is not visually observed during the sampling event, the location of the discharge and reasoning for not obtaining observations must be recorded.

### 5.5.3 Visual Monitoring Procedures

Visual monitoring will be conducted by trained team members. The name(s) and contact number(s) of the site visual monitoring personnel are listed below, and their training qualifications are provided in Appendix C.

Assigned inspector: Yolynn St. John

Contact phone: (707) 498-4912

Alternate inspector: Kurt Kernan

Contact phone: (707) 499-0699

Visual observations will be documented on the *Visual Observation Log* (see Appendix G). Visual observations will be supplemented with a site-specific BMP inspection checklist. Photographs used to document observations will be referenced on the *Visual Observation Log* and maintained with the completed inspection forms in a separate binder onsite.

### 5.5.4 Visual Monitoring Follow-Up and Reporting

Correction of deficiencies identified by the observations, including required repairs or maintenance of BMPs, will be initiated and completed as soon as possible.



Response actions will include the following:

- Report observations to the Pollution Prevention Team Leader or designated individual;
- Identify and implement appropriate response actions;
- Determine if SWPPP update is needed;
- Verify completion of response actions; and
- Document response actions.

If identified deficiencies require design changes, including additional BMPs, the implementation of changes will be completed as soon as possible, and the SWPPP will be amended to reflect the changes. BMP deficiencies identified in site observation reports and correction of deficiencies will be tracked on the *BMP Observation Checklist* and will be retained in Appendix G.

Results of visual monitoring must be summarized and reported in the Annual Report.

## 5.6 Sampling and Analysis Procedures

This section describes the methods and procedures that will be followed for stormwater sampling and analysis. It contains information for sampling schedule, sampling locations, monitoring preparation, analytical constituents, sample collection, sample analysis, and data evaluation and reporting.

### 5.6.1 Sampling Schedule

Stormwater samples at each discharge location will be collected and analyzed from two QSEs within the first half of each reporting year (July 1 to December 31), and two QSEs within the second half of each reporting year (January 1 to June 30).

A QSE is a precipitation event that:

- Produces a discharge for at least one drainage area; and
- Is preceded by 48 hours with no discharge from any drainage area.

### 5.6.2 Sampling Locations

Sampling locations include locations where industrial activity impacted stormwater discharges from the site.

Discharge reduction BMPs have been implemented at both the southern and northern yards that are anticipated to cease discharges from those areas. Former discharge locations SL-1 through SL-4 are now “observation locations” (OL-#). If a discharge is observed from one of these locations a sample of the discharge will be collected. The observation locations are shown on the site maps in Appendix A and are included in Table 5.1.



**Table 5.1 Observation Locations**

Observation Designation	Observation Location Description	Observation Location Latitude and Longitude
OL-1	Outlet from sediment traps across from fabrication shop	40.896239°, -124.006913°
OL-1a	Outlet from sediment traps in southeast corner of Southern Yard.	40.895553°, -124.006222°
OL-2	Outlet from sediment traps along southern boundary Southern Yard	40.895495°, -124.008746°
OL-3	Southern boundary south edge of yard Below truck shop	40.895665°, -124.009731°
OL-4	Northern Yard: West side of stormwater retention area	40.897719°, -124.014531°

### 5.6.3 Monitoring Preparation

Samples on the project site will be collected by the following sampling personnel:

Name/Telephone Number: Yolynn St. John (707) 498-4912

An adequate stock of monitoring supplies and equipment for sampling will be available onsite prior to a sampling event. Monitoring supplies and equipment will be stored in a cool temperature environment that will not come into contact with rain or direct sunlight. Sampling personnel will be available to collect samples in accordance with the sampling schedule. Supplies maintained at the facility will include, but are not limited to: clean powder-free nitrile gloves; sample collection equipment; coolers; appropriate number and volume of sample containers; identification labels; re-sealable storage bags; paper towels; personal rain gear; ice; and *Sampling Field Log Sheets* and Chain of Custody (CoC) forms, which are provided in Appendix G.

### 5.6.4 Analytical Constituents

Table 5.2 identifies the constituents identified for sampling and analysis. The facility SIC code is 1429–crushed and broken stone (not elsewhere classified), which does not have additional sample parameters in accordance with Table 1 in the General Permit. Pollutant source assessment parameters are included within the sample suite and identified in Table 5.2.

**Table 5.2 Analytical Constituents**

Constituent	Reason
pH	IGP <sup>a</sup> required constituent
Oil and Grease	
Total Suspended Solids	
Iron	Pollutant Source Assessment
Aluminum	
Copper	
Lead	RWQCB <sup>b</sup> requested
Zinc	



**Table 5.2 Analytical Constituents**

Constituent	Reason
Chemical Oxygen Demand	RWQCB requested
Nitrate + Nitrite	

<sup>a</sup> IGP: Industrial General Permit

<sup>b</sup> RWQCB: Regional Water Quality Control Board

Although historical laboratory analytical data from stormwater samples collected from the site indicate concentrations of copper, lead, zinc, chemical oxygen demand and nitrate + nitrite below their respective NALs, the RWQCB requested these parameters remain on the sampling suite.

### 5.6.5 Sample Collection

Samples of discharge will be collected at the designated sampling location shown on the site maps in Appendix A. Samples will be collected within 4 hours of:

- The start of the discharge; or
- The start of facility operations if the QSE occurs within the previous 12-hour period.

Sample collection is required during scheduled facility operating hours and when sampling conditions are safe.

Grab samples will be collected and preserved in accordance with the methods identified in Table 5.3, "Sample Collection, Preservation and Analysis for Water Quality Samples" provided in Section 5.6.6. Grab samples will be collected and analyzed for pH using a calibrated portable pH instrument. The pH analysis will be performed as soon as practicable, but no later than 15 minutes after sample collection.

Only team members properly trained in water quality sampling will collect samples. Sample collection and handling requirements are described in Section 5.8.

### 5.6.6 Sample Analysis

Samples will be analyzed using the analytical methods identified in the Table 5.4.

Samples will be analyzed by:

Laboratory Name:	North Coast Laboratories Ltd.
Street Address:	5680 West End Road
City, State Zip:	Arcata, CA 95521-9202
Telephone Number:	(707) 822-4649
Point of Contact:	Office Manager
ELAP Certification Number:	1247

Samples will be delivered to the laboratory by facility personnel.



**Table 5.3 Sample Collection, Preservation and Analysis for Water Quality Samples**

Constituent	Analytical Method	Minimum Sample Volume	Sample Containers	Sample Preservation	Reporting Limit	Maximum Holding Time
pH	pH Units (see Section X1.C.2 of the IGP <sup>a</sup> )	Field or Container	½ gallon plastic (with TSS)	None	pH 1 to 12	15 minutes
Total Suspended Solids (TSS)	SM <sup>b</sup> 2540-D	½ gallon	½ gallon plastic (with pH)	None	1.0 mg/L <sup>c</sup>	14 days
Chemical Oxygen Demand (COD)	SM5220D	500 ml <sup>d</sup>	500 ml plastic	H <sub>2</sub> SO <sub>4</sub> <sup>e</sup>	50 mg/L	28 days
Oil and Grease (O&G)	EPA <sup>f</sup> 1664-A	2 liters	Two 1-liter brown glass	HCl <sup>g</sup>	5 mg/L	14 days
Nitrate + Nitrite (N+N)	SM 4500-N03-E	½ gallon	½ gallon plastic (with TSS)	None	0.10 mg/L	48 hours
Aluminum	EPA 200.7 Total Recoverable	500 ml	500 ml plastic	HNO <sub>3</sub> <sup>h</sup>	50 ug/L <sup>i</sup>	6 months
Copper						
Iron						
Lead						

<sup>a</sup> IGP: Industrial General Permit<sup>b</sup> SM: Standard Method<sup>c</sup> mg/L: milligrams per liter<sup>d</sup> ml: milliliters<sup>e</sup> H<sub>2</sub>SO<sub>4</sub>: sulfuric acid<sup>f</sup> EPA: U.S. Environmental Protection Agency<sup>g</sup> HCl: hydrochloric acid<sup>h</sup> HNO<sub>3</sub>: nitric acid<sup>i</sup> ug/L: micrograms per liter

### 5.6.7 Data Evaluation and Reporting

The designated member of the Pollution Prevention Team will complete an evaluation of the water quality sample analytical results.

Sampling and analytical results for individual samples will be submitted via SMARTS within 30 days of obtaining results for each sampling event.

The method detection limit will be provided when an analytical result from samples taken is reported by the laboratory as a "non-detect" or less than the method detection limit. A value of zero will not be reported.

Analytical results that are reported by the laboratory as below the minimum level (often referred to as the reporting limit) but above the method detection limit will be provided.

Reported analytical results will be averaged automatically by SMARTS at the end of the reporting year. For calculations required by the General Permit a value of zero shall be used for effluent sampling analytical results that are reported by the laboratory as "non-detect" or less than the Method Detection Limit (MDL).

## 5.7 Training of Sampling Personnel

Sampling personnel will be trained to collect, maintain, and ship samples in accordance with the General Permit and this SWPPP. Training records of designated sampling personnel are provided in Appendix C. The stormwater sampler and alternate have received the following stormwater sampling training:

**Table 5.4 Training of Sampling Personnel**

Name	Experience and Training
Yolynn St. John	10+ years as environmental compliance manager at facility. Qualified Industrial Stormwater Practitioner, Qualified SWPPP Practitioner and Certified Inspector Sediment & Erosion Control
Kurt Kernen	10+ years of experience managing water quality compliance on construction projects. Qualified SWPPP Practitioner, and Certified Inspector Sediment & Erosion Control

## 5.8 Sample Collection and Handling

### 5.8.1 Sample Collection

Samples will be collected at the designated sampling locations shown on the site maps and listed in the preceding sections. Samples will be collected, maintained, and shipped in accordance with the requirements in the following sections.

Grab samples will be collected and preserved in accordance with the methods identified in preceding sections.



To maintain sample integrity and prevent cross-contamination, sample collection personnel will follow the protocols below:

- Collect samples (for laboratory analysis) only in analytical laboratory-provided sample containers;
- Wear clean, powder-free nitrile gloves when collecting samples;
- Change gloves whenever something not known to be clean has been touched;
- Change gloves between sites;
- Decontaminate all equipment (for example, bucket, tubing) prior to sample collection using a trisodium phosphate water wash, distilled water rinse, and final rinse with distilled water. (Dispose of wash and rinse water appropriately, that is, do not discharge to storm drain or receiving water). Do not decontaminate laboratory provided sample containers;
- Do not smoke during sampling events;
- Never sample near a running vehicle;
- Do not park vehicles in the immediate sample collection area (even non-running vehicles);
- Do not eat or drink during sample collection; and
- Do not breathe, sneeze, or cough in the direction of an open sample container.

The most important aspect of grab sampling is to collect a sample that represents the entire runoff stream. Typically, samples are collected by dipping the collection container in the runoff flow paths and streams as noted below.

- For small streams and flow paths, simply dip the bottle facing upstream until full.
- For larger stream that can be safely accessed, collect a sample in the middle of the flow stream by directly dipping the mouth of the bottle. Once again making sure that the opening of the bottle is facing upstream as to avoid any contamination by the sampler.
- For larger streams that cannot be safely waded, pole-samplers may be needed to safely access the representative flow.
- Avoid collecting samples from ponded, sluggish, or stagnant water.
- Avoid collecting samples directly downstream from a bridge as the samples can be affected by the bridge structure or runoff from the road surface.
- Do not stand upstream of the sampling point within the flow path.

Note, that depending upon the specific analytical test, some containers may contain preservatives. These containers should **never** be dipped into the stream but filled indirectly from the collection container.

### 5.8.2 Sample Handling

Field pH measurements must be conducted immediately. Do not store pH samples for later measurement.





Samples for laboratory analysis must be handled as follows. Immediately following sample collection:

- Cap sample containers
- Complete sample container labels
- Sealed containers in a re-sealable storage bag
- Place sample containers into an ice-chilled cooler
- Document sample information on the "Sampling Field Log Sheet"
- Complete the CoC

Samples for laboratory analysis must be maintained between 0-6 degrees Celsius during delivery to the laboratory. Samples must be kept on ice, or refrigerated, from sample collection through delivery to the laboratory. Place samples to be shipped inside coolers with ice. Make sure the sample bottles are well packaged to prevent breakage and secure cooler lids with packaging tape.

Ship samples that will be laboratory analyzed to the analytical laboratory right away. Hold times are measured from the time the sample is collected to the time the sample is analyzed. The General Permit requires that samples be received by the analytical laboratory within 48 hours of the physical sampling (unless required sooner by the analytical laboratory).

### 5.8.3 Sample Documentation Procedures

Original data documented on sample bottle identification labels, *Sampling Log*, and CoCs will be recorded using waterproof ink. If an error is made on a document, sampling personnel will make corrections by lining through the error and entering the correct information. The erroneous information will not be obliterated. Corrections will be initialed and dated.

Duplicate samples, if collected, will be identified consistent with the numbering system for other samples to prevent the laboratory from identifying duplicate samples. Duplicate samples will be identified in the Sampling Log.

Sample documentation procedures include the following:

Sample Bottle Identification Labels: Sampling personnel will attach an identification label to each sample bottle. Sample identification will uniquely identify each sample location.

Field Log Sheets: Sampling personnel will complete the *Effluent Sampling Field Log Sheet* and *Receiving Water Sampling Field Log Sheet* for each sampling event, as appropriate.

Chain of Custody: Sampling personnel will complete the CoC for each sampling event for which samples are collected for laboratory analysis. The sampler will sign the CoC when the sample(s) is turned over to the testing laboratory or courier.

## 5.9 Quality Assurance and Quality Control

An effective Quality Assurance and Quality Control (QA/QC) plan will be implemented as part of the MIP to ensure that analytical data can be used with confidence. QA/QC procedures to be initiated include the following:

- |                             |                     |
|-----------------------------|---------------------|
| • Field logs                | • QA/QC Samples     |
| • Clean sampling techniques | • Data verification |
| • CoCs                      |                     |



Each of these procedures is discussed in more detail in the following sections.

### 5.9.1 Field Logs

The purpose of field logs is to record sampling information and field observations during monitoring that may explain any uncharacteristic analytical results. Sampling information to be included in the field log include the date and time of water quality sample collection, sampling personnel, sample container identification numbers, and types of samples that were collected. Field observations should be noted in the field log for any abnormalities at the sampling location (color, odor, BMPs, and so on). Field measurements for pH and turbidity should also be recorded in the field log. A Visual Inspection Field Log, an Effluent Sampling Field Log Sheet, are included in Appendix G.

### 5.9.2 Clean Sampling Techniques

Clean sampling techniques involve the use of certified clean containers for sample collection and clean powder-free nitrile gloves during sample collection and handling. As discussed in Section 6.8, adoption of a clean sampling approach will minimize the chance of field contamination and questionable data results.

### 5.9.3 Chain of Custody

The sample CoC is an important documentation step that tracks samples from collection through analysis to ensure the validity of the sample. Sample CoC procedures include the following:

- Proper labeling of samples
- Use of CoC forms for all samples
- Prompt sample delivery to the analytical laboratory

Analytical laboratories usually provide CoC forms to be filled out for sample containers. An example CoC is included in Appendix G.

### 5.9.4 QA/QC Samples

QA/QC samples provide an indication of the accuracy and precision of the sample collection; sample handling; field measurements; and analytical laboratory methods.

### 5.9.5 Data Verification

After results are received from the analytical laboratory, the discharger will verify the data to ensure that it is complete, accurate, and the appropriate QA/QC requirements were met. Data must be verified as soon as the data reports are received. Data verification will include:

- Check the CoC and laboratory reports.  
Make sure all requested analyses were performed and all samples are accounted for in the reports.
- Check laboratory reports to make sure hold times were met and that the reporting levels meet or are lower than the reporting levels agreed to in the contract.
- Check data for outlier values and follow up with the laboratory.  
Occasionally typographical errors, unit reporting errors, or incomplete results are reported and



should be easily detected. These errors need to be identified, clarified, and corrected quickly by the laboratory. Especially note data that is an order of magnitude or more different than similar locations, or is inconsistent with previous data from the same location.

- Check laboratory QA/QC results.  
EPA establishes QA/QC checks and acceptable criteria for laboratory analyses. These data are typically reported along with the sample results. Evaluate the reported QA/QC data to check for contamination (method, field, and equipment blanks), precision (laboratory matrix spike duplicates), and accuracy (matrix spikes and laboratory control samples). When QA/QC checks are outside acceptable ranges, the laboratory must flag the data, and usually provides an explanation of the potential impact to the sample results.
- Check the data set for outlier values and accordingly, confirm results and re-analyze samples where appropriate.  
Sample re-analysis should only be undertaken when it appears that some part of the QA/QC resulted in a value out of the accepted range. Sample results may not be discounted unless the analytical laboratory identifies the required QA/QC criteria were not met and confirms this in writing.

Field data including pH measurements and visual observations must be verified as soon as the Visual Observation and Sampling Logs are received, typically at the end of the monitoring event. Field data verification will include:

- Check logs to make sure all required measurements were completed and appropriately documented.
- Check reported values that appear out of the typical range or inconsistent;  
Follow-up immediately to identify potential reporting or equipment problems, if appropriate, recalibrate equipment after sampling.
- Verify equipment calibrations.
- Review observations noted on the logs.
- Review notations of any errors and actions taken to correct the equipment or recording errors.

## 5.10 Records Retention

Records of stormwater monitoring information and copies of reports (including Annual Reports) must be retained for a period of at least 5 years from date of submittal or longer if required by the Regional Water Board.

Results of visual observations, field measurements, and laboratory analyses must be kept in the SWPPP along with CoCs, and other documentation related to the monitoring.

Records to be retained include:

- The date, place, and time of inspections, sampling, visual observations, and/or measurements, including precipitation
- The individual(s) who performed the inspections, sampling, visual observation, and/or field measurements
- The date and approximate time of field measurements and laboratory analyses



- The individual(s) who performed the laboratory analyses
- A summary of all analytical results, the method detection limits and reporting limits, and the analytical techniques or methods used
- Weather reports
- QA/QC records and results
- Calibration records
- Visual observation and sample collection exception records
- The records of any corrective actions and follow-up activities that resulted from analytical results, visual observations, or inspections



## **MIP Attachment 1: Field Meter Instructions**

## Section 6 References

California Stormwater Quality Association. (2012). "Stormwater BMP Handbook Portal: Industrial Commercial, August 2014." Redondo Beach, CA: CASQA. Accessed at: [www.casqa.org](http://www.casqa.org)

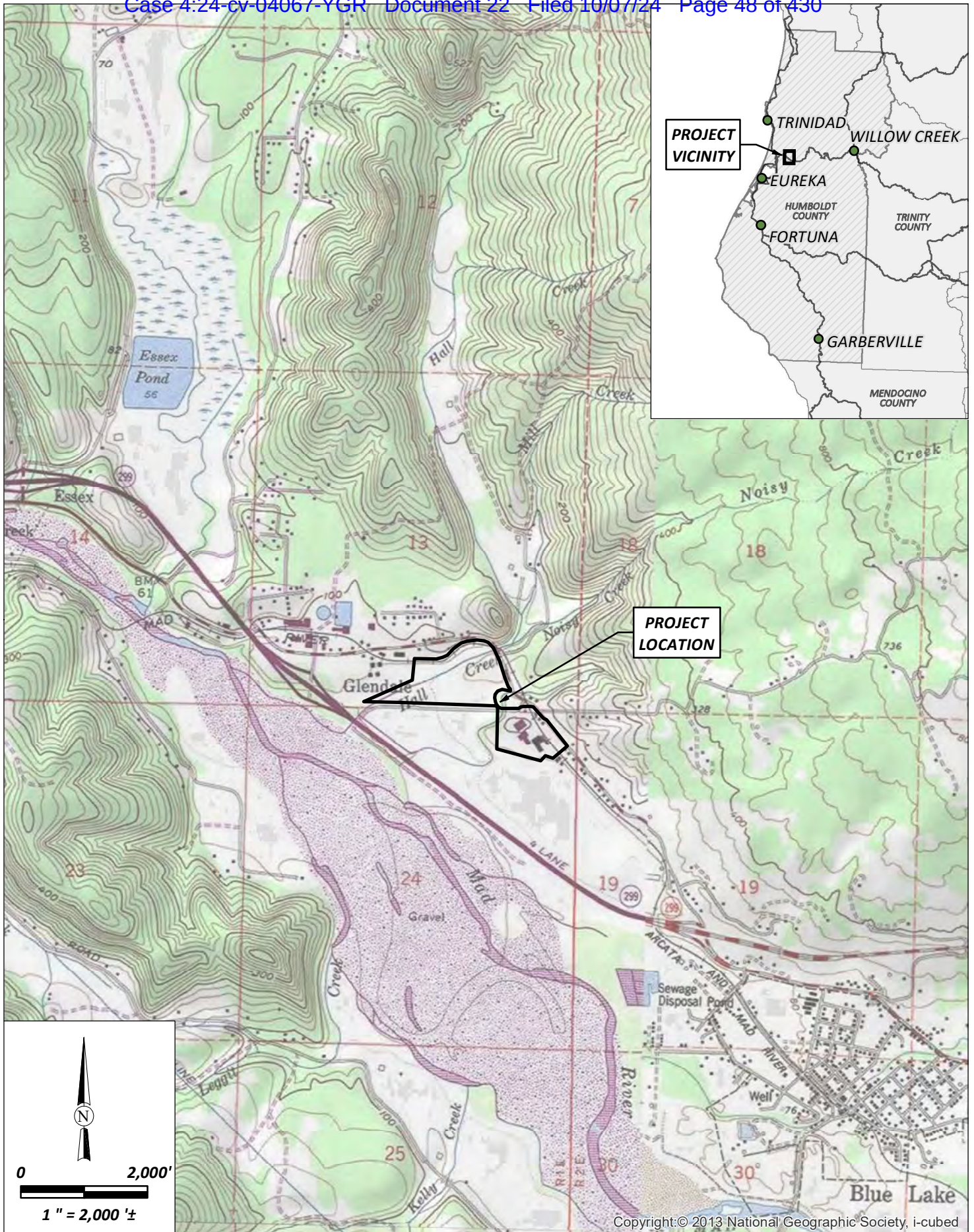
State Water Resources Control Board (2014). Order 2014-0057-DWQ, NPDES General Permit No. CAS000001: National Pollutant Discharges Elimination System (NPDES) California General Permit for Storm Water Discharge Associated with Industrial Activities. Available on-line at: [http://www.waterboards.ca.gov/water\\_issues/programs/stormwater/industrial.shtml](http://www.waterboards.ca.gov/water_issues/programs/stormwater/industrial.shtml).



## Appendix A: Site Maps



Path: \\arcata\svr1\projects\2016\016181A-Kernen-Stmwr\GIS\PROJ\_MXD\SWP\SWP\_Fig1\_ProjectLocation.mxd User Name: psundberg DATE: 2/2/21 4:04PM



Copyright:© 2013 National Geographic Society, i-cubed

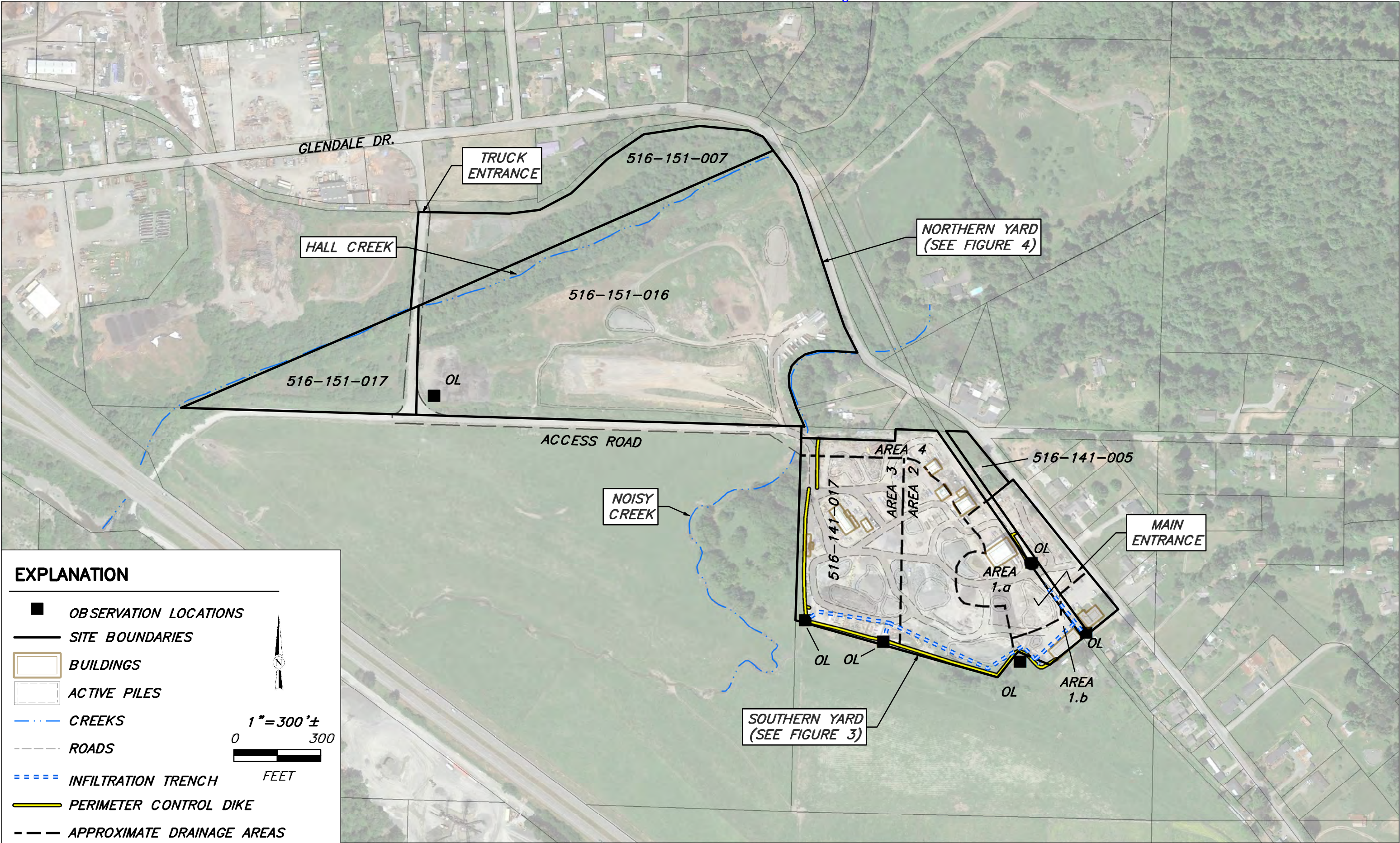


Kernen Construction  
SWPPP  
Glendale, Humboldt County, California  
February 2021

Project Location  
SHN 016181  
SWP\_Fig1\_ProjectLocation  
Figure 1



\\arcata\svr1\Projects\2016\016181A-Kernen-Stmwr\GIS\PROJ\_MXD\SWP\_Fig2\_SiteOverview.mxd;User:mrose;Printed:2/11/2022



**EXPLANATION**












-  **OBSERVATION LOCATIONS**
  -  **SITE BOUNDARIES**
  -  **BUILDINGS**
  -  **ACTIVE PILES**
  -  **CREEKS**
  -  **ROADS**
  -  **INFILTRATION TRENCH**
  -  **PERIMETER CONTROL DIKE**
  -  **APPROXIMATE DRAINAGE AREAS**
  -  **EASEMENTS**
  -  **COUNTY GIS PARCELS**
- 1" = 300' ±
- 0 300
- FEET

PHOTO SOURCE: GOOGLE, 5/26/2016



Kernen Construction  
SWPPP  
Glendale, Humboldt County, California













Site Plan  
Overview  
SHN 016181







EXPLANATION

-  **OBSERVATION LOCATION**
-  **DRAINAGE DIRECTION**
-  **EASEMENTS**
-  **ROADS**
-  **SITE BOUNDARIES**
-  **DRAINAGE AREAS**
-  **CREEKS**
-  **CHECK DAMS**
-  **ACTIVE PILES**
-  **SETTLING BASIN**
-  **VEGETATED SWALE**
-  **COUNTY GIS PARCELS**

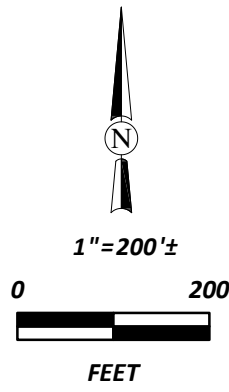
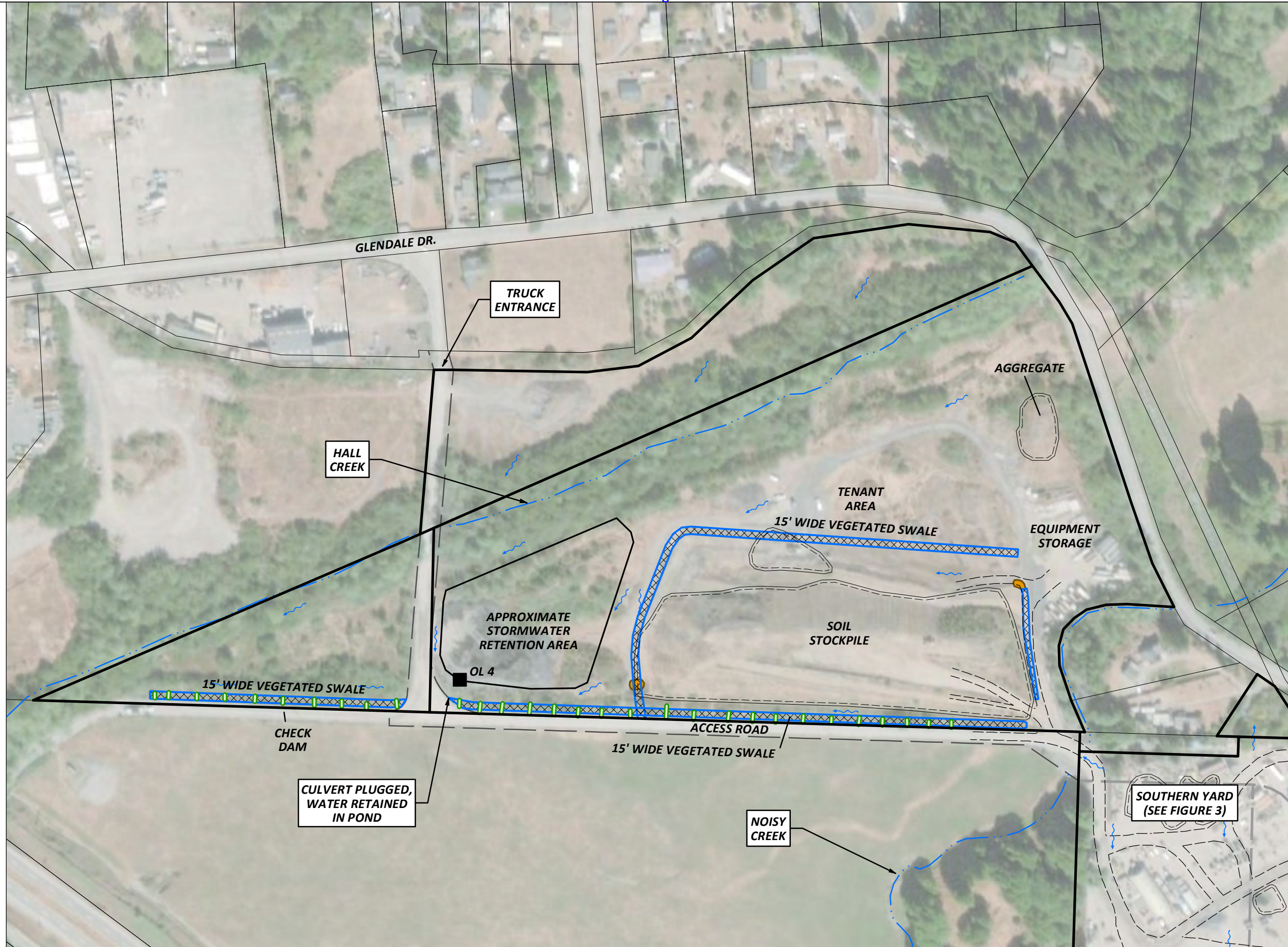


PHOTO SOURCE: ESRI/DIGITAL GLOBE, 9/19/2018  
PARCEL DATA SOURCE: COUNTY OF HUMBOLDT GIS



## Appendix B: Permit Registration Documents

Permit Registration Documents included in this Appendix

Y/N	Permit Registration Document
	Notice of Intent
	Certification
	Copy of Annual Fee Receipt
	Site Maps, see Appendix A





State Water Resources Control Board  
**NOTICE OF INTENT**

GENERAL PERMIT TO DISCHARGE STORM WATER  
ASSOCIATED WITH INDUSTRIAL ACTIVITY (WQ ORDER No. 2014-0057-DWQ)  
(Excluding Construction Activities)



GAVIN NEWSOM  
GOVERNOR



JARED BLUMENFELD  
SECRETARY FOR  
ENVIRONMENTAL PROTECTION

WDID: 1 12I017319

Status: Active

**Operator Information**

Type: Private Business

Name: Kernen Construction Co Contact Name: Scott Farley  
Address: PO Box 1340 Title: Partner  
Address 2: \_\_\_\_\_ Phone Number: 707-826-8686  
City/State/Zip: Blue Lake CA 95525 Email Address: ystjohn@kernenconstruction.com  
Federal Tax ID: \_\_\_\_\_

**Facility Information**

Level:

Contact Name: Scott Farley Title: Partner  
Site Name: Kernen Construction Glendale Yard  
Address: 2350 Glendale Dr  
City/State/Zip: Mc Kinleyville CA 95519 Site Phone #: 707-826-8686  
County: Humboldt Email Address: ystjohn@kernenconstruction.com  
Latitude: 40.905931 Longitude: -124.038144 Site Size: 37 Acres  
Industrial Area Exposed to Storm Water: 37 Acres  
Percent of Site Impervious (Including Rooftops): %

**SIC Code Information**

1. 1429 Crushed and Broken Stone, NEC  
2. 4212 Local Trucking Without Storage  
3. \_\_\_\_\_

**Additional Information**

Receiving Water: Hall Creek Flow: Indirectly  
Storm Drain System: \_\_\_\_\_  
Compliance Group: \_\_\_\_\_

RWQCB Jurisdiction: Region 1 - North Coast

Phone: 707-576-2220

Email: r1\_stormwater@waterboards.ca.gov

**Certification**

Name: Norman Farley Date: June 08, 2015  
Title: Partner



January 20, 2021

Scott Farley  
Kernen Construction Co  
PO Box 1340  
Blue Lake, CA 95525

Facility Info: Kernen Construction Glendale Yard  
2350 Glendale Dr  
Mc Kinleyville, CA 95519  
SIC Code(s): 1429 4212

Waste Discharge Identification Number: 1 12I017319

Date Processed: June 19, 2002

#### RECEIPT OF YOUR NOTICE OF INTENT (NOI)

The State Water Resources Control Board (State Water Board) received and processed the NOI to comply with the terms of the General Permit for Storm Water Discharges Associated with Industrial Activity Order 2014-0057-DWQ.

Waste Discharger Identification (WDID) number 1 12I017319 is assigned to the facility referenced above.

Accordingly, you are required to comply with all applicable permit requirements.

Notice of Termination (NOT) is required to be submitted to the State Water Board should the owner or operator of the facility change or upon closure of the facility. Until an NOT is submitted you will continue and are responsible to pay the annual fee invoiced each April.

If you have any further questions, please contact your local Regional Water Board at 707-576-2220.

Please visit the storm water web page at [www.waterboards.ca.gov/water\\_issues/programs/stormwater/industrial.shtml](http://www.waterboards.ca.gov/water_issues/programs/stormwater/industrial.shtml) for storm water related information.

Sincerely,  
Storm Water Program  
Division of Water Quality

JOAQUIN ESQUIVEL, CHAIR | EILEEN SOBECK, EXECUTIVE OFFICER

1001 I Street, PO Box 1977, Sacramento, California, 95812 | [www.waterboards.ca.gov](http://www.waterboards.ca.gov), ph:1-866-563-3107, fax:(916) 341-5543

## **Appendix C: Training Reporting Form**





## **Appendix D: Responsible Parties**

**Authorization of Duly Authorized Representatives**

Facility Name:

**KERNEN CONSTRUCTION – GLENDALE YARD**

Waste Discharge Identification (WDID):

**1 12I017319**

<b>Name of Personnel</b>	<b>Project Role</b>	<b>Company</b>	<b>Signature</b>	<b>Date</b>

## Identification of QISP

Facility Name:

**KERNEN CONSTRUCTION – GLENDALE YARD**

Waste Discharge Identification (WDID):

**1 12I017319**

The following are QISPs associated with this project

<b>Name of Personnel<sup>(1)a</sup></b>	<b>Company</b>	<b>Date</b>
Yolynn St. John	Kernen Construction	9-13-2016
Gwendolyn Erickson	SHN	12-31-2020

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<sup>a</sup> If additional QISPs are required, add additional lines and include information here

## **Appendix E: SWPPP Amendment Certifications**

SWPPP Amendment No. 9

Project Name: Kernen Construction

Project Number: 1 121017319

Legally Responsible Person's Certification of the  
Stormwater Pollution Prevention Plan Amendment

"This Stormwater Pollution Prevention Plan and attachments were prepared under my direction to meet the requirements of the California Industrial General Permit (SWRCB Order No. 2014-0057-DWQ)."

Scott Farley  
LRP's Signature

2-7-2022

Date

Scott Farley  
LRP Name

Partner

LRP Title

Kernen Construction  
Title and Affiliation

707-826-8686

Telephone

2350 Glendale Dr. McKin  
Address

ystjohn@Kernenconstruction.com  
Email



**SWPPP Amendment No.** \_\_\_\_\_

Project Name: \_\_\_\_\_

Project Number: \_\_\_\_\_

**Legally Responsible Person's Certification of the  
Stormwater Pollution Prevention Plan Amendment**

"This Stormwater Pollution Prevention Plan and attachments were prepared under my direction to meet the requirements of the California Industrial General Permit (SWRCB Order No. 2014-0057-DWQ)."

\_\_\_\_\_  
LRP's Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
LRP Name

\_\_\_\_\_  
LRP Title

\_\_\_\_\_  
Title and Affiliation

\_\_\_\_\_  
Telephone

\_\_\_\_\_  
Address

\_\_\_\_\_  
Email

## **Appendix F: CASQA Stormwater BMP Handbook Portal: Industrial and Commercial Fact Sheets**

# Non-Stormwater Discharges SC-10

## Description

Non-stormwater discharges (NSWDs) are flows that do not consist entirely of stormwater. Some non-stormwater discharges do not include pollutants and may be discharged to the storm drain if local regulations allow. These include uncontaminated groundwater and natural springs. There are also some non-stormwater discharges that typically do not contain pollutants and may be discharged to the storm drain with conditions. These include: potable water sources, fire hydrant flushing, air conditioner condensate, landscape irrigation drainage and landscape watering, emergency firefighting, etc. as discussed in Section 2.

However there are certain non-stormwater discharges that pose an environmental concern. These discharges may originate from illegal dumping of industrial material or wastes and illegal connections such as internal floor drains, appliances, industrial processes, sinks, and toilets that are illegally connected to the nearby storm drainage system through on-site drainage and piping. These unauthorized discharges (examples of which may include: process waste waters, cooling waters, wash waters, and sanitary wastewater) can carry substances such as paint, oil, fuel and other automotive fluids, chemicals and other pollutants into storm drains.

Non-stormwater discharges will need to be addressed through a combination of detection and elimination. The ultimate goal is to effectively eliminate unauthorized non-stormwater discharges to the stormwater drainage system through implementation of measures to detect, correct, and enforce against illicit connections and illegal discharges of

## Objectives

- *Cover*
- *Contain*
- *Educate*
- *Reduce/Minimize*
- *Product Substitution*

## Targeted Constituents

<i>Sediment</i>	
<i>Nutrients</i>	✓
<i>Trash</i>	
<i>Metals</i>	✓
<i>Bacteria</i>	✓
<i>Oil and Grease</i>	✓
<i>Organics</i>	✓

## Minimum BMPs Covered

	<i>Good Housekeeping</i>	✓
	<i>Preventative Maintenance</i>	
	<i>Spill and Leak Prevention and Response</i>	✓
	<i>Material Handling &amp; Waste Management</i>	
	<i>Erosion and Sediment Controls</i>	
	<i>Employee Training Program</i>	✓
	<i>Quality Assurance Record Keeping</i>	✓





# Non-Stormwater Discharges SC-10

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pollutants on streets and into the storm drain system and downstream water bodies.

## Approach

Initially the Discharger must make an assessment of non-stormwater discharges to determine which types must be eliminated or addressed through BMPs. The focus of the following approach is the elimination of unauthorized non-stormwater discharges. See other BMP Fact Sheets for activity-specific pollution prevention procedures.

### *General Pollution Prevention Protocols*

- ❑ Implement waste management controls described in SC-34 Waste Handling and Disposal.
- ❑ Develop clear protocols and lines of communication for effectively prohibiting non-stormwater discharges, especially those that are not classified as hazardous. These are often not responded to as effectively as they need to be.
- ❑ Stencil or demarcate storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as “Dump No Waste Drains to Stream” or similar stenciled or demarcated next to them to warn against ignorant or unintentional dumping of pollutants into the storm drainage system.
- ❑ Manage and control sources of water such as hose bibs, faucets, wash racks, irrigation heads, etc. Identify hoses and faucets in the SWPPP, and post signage for appropriate use.

### *Non-Stormwater Discharge Investigation Protocols*

Identifying the sources of non-stormwater discharges requires the Discharger to conduct an investigation of the facility at regular intervals. There are several categories of non-stormwater discharges:

- ❑ Visible, easily identifiable discharges, typically generated as surface runoff, such as uncontained surface runoff from vehicle or equipment washing; and
- ❑ Non-visible, (e.g., subsurface) discharges into the site drainage system through a variety of pathways that are not obvious.

The approach to detecting and eliminating non-stormwater discharges will vary considerably, as discussed below:

### *Visible and identifiable discharges*

- ❑ Conduct routine inspections of the facilities and of each major activity area and identify visible evidence of unauthorized non-stormwater discharges. This may include:
  - ✓ Visual observations of actual discharges occurring;

# Non-Stormwater Discharges SC-10

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- ✓ Evidence of surface staining, discoloring etc. that indicates that discharges have occurred;
  - ✓ Pools of water in low lying areas when a rain event has not occurred; and
  - ✓ Discussions with operations personnel to understand practices that may lead to unauthorized discharges.
- If evidence of non-stormwater discharges is discovered:
- ✓ Document the location and circumstances using Worksheets 5 and 6 (Section 2 of the manual), including digital photos;
  - ✓ Identify and implement any quick remedy or corrective action (e.g., moving uncovered containers inside or to a proper location); and
  - ✓ Develop a plan to eliminate the discharge. Consult the appropriate activity-specific BMP Fact Sheet for alternative approaches to manage and eliminate the discharge.
- Consult the appropriate activity-specific BMP Fact Sheet for alternative approaches to manage and eliminate the discharge. Make sure the facility SWPPP is up-to-date and includes applicable BMPs to address the non-stormwater discharge.

## ***Other Illegal Discharges (Non visible)***

### *Illicit Connections*

- Locate discharges from the industrial storm drainage system to the municipal storm drain system through review of “as-built” piping schematics.
- Isolate problem areas and plug illicit discharge points.
- Locate and evaluate discharges to the storm drain system.
- Visual Inspection and Inventory:
  - ✓ Inventory and inspect each discharge point during dry weather.
  - ✓ Keep in mind that drainage from a storm event can continue for a day or two following the end of a storm and groundwater may infiltrate the underground stormwater collection system.
  - ✓ Non-stormwater discharges are often intermittent and may require periodic inspections.

### *Review Infield Piping*

- A review of the “as-built” piping schematic is a way to determine if there are any connections to the stormwater collection system.

## Non-Stormwater Discharges **SC-10**

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- ❑ Inspect the path of loading/unloading area drain inlets and floor drains in older buildings.
- ❑ Never assume storm drains are connected to the sanitary sewer system.

### *Monitoring for investigation/detection of illegal discharges*

- ❑ If a suspected illegal or unknown discharge is detected, monitoring of the discharge may help identify the content and/or suggest the source. This may be done with a field screening analysis, flow meter measurements, or by collecting a sample for laboratory analysis. Section 5 and Appendix D describe the necessary field equipment and procedures for field investigations.
- ❑ Investigative monitoring may be conducted over time. For example if, a discharge is intermittent, then monitoring might be conducted to determine the timing of the discharge to determine the source.
- ❑ Investigative monitoring may be conducted over a spatial area. For example, if a discharge is observed in a pipe, then monitoring might be conducted at accessible upstream locations in order to pinpoint the source of the discharge.
- ❑ Generally, investigative monitoring requiring collection of samples and submittal for lab analysis requires proper planning and specially trained staff.

### *Smoke Testing*

Smoke testing of wastewater and stormwater collection systems is used to detect connections between the two piping systems. Smoke testing is generally performed at a downstream location and the smoke is forced upstream using blowers to create positive pressure. The advantage to smoke testing is that it can potentially identify multiple potential discharge sources at once.

- ❑ Smoke testing uses a harmless, non-toxic smoke cartridges developed specifically for this purpose.
- ❑ Smoke testing requires specialized equipment (e.g., cartridges, blowers) and is generally only appropriate for specially trained staff.
- ❑ A Standard Operating Procedure (SOP) for smoke testing is highly desirable. The SOP should address the following elements:
  - ✓ Proper planning and notification of nearby residents and emergency services is necessary since introducing smoke into the system may result in false alarms;
  - ✓ During dry weather, the stormwater collection system is filled with smoke and then traced back to sources;

## Non-Stormwater Discharges **SC-10**

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- ✓ Temporary isolation of segments of pipe using sand bags is often needed to force the smoke into leaking pipes; and
- ✓ The appearance of smoke in a waste vent pipe, at a sewer manhole, or even the base of a toilet indicates that there may be a connection between the sanitary and storm water systems.
- Most municipal wastewater agencies will have necessary staff and equipment to conduct smoke testing and they should be contacted if cross connections with the sanitary sewer are suspected. See SC-44 Drainage System Maintenance for more information.

### *Dye Testing*

- Dye testing is typically performed when there is a suspected specific pollutant source and location (i.e., leaking sanitary sewer) and there is evidence of dry weather flows in the stormwater collection system.
- Dye is released at a probable upstream source location, either the facility's sanitary or process wastewater system. The dye must be released with a sufficient volume of water to flush the system.
- Operators then visually examine the downstream discharge points from the stormwater collection system for the presence of the dye.
- Dye testing can be performed informally using commercially available products in order to conduct an initial investigation for fairly obvious cross-connections.
- More detailed dye testing should be performed by properly trained staff and follow SOPs. Specialized equipment such as fluorometers may be necessary to detect low concentrations of dye.
- Most municipal wastewater agencies will have necessary staff and equipment to conduct dye testing and they should be contacted if cross connections with the sanitary sewer are suspected.

### *TV Inspection of Drainage System*

- Closed Circuit Television (CCTV) can be employed to visually identify illicit connections to the industrial storm drainage system. Two types of CCTV systems are available: (1) a small specially designed camera that can be manually pushed on a stiff cable through storm drains to observe the interior of the piping, or (2) a larger remote operated video camera on treads or wheels that can be guided through storm drains to view the interior of the pipe.
- CCTV systems often include a high-pressure water jet and camera on a flexible cable. The water jet cleans debris and biofilm off the inside of pipes so the camera can take video images of the pipe condition.

## Non-Stormwater Discharges SC-10

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- ❑ CCTV units can detect large cracks and other defects such as offsets in pipe ends caused by root intrusions or shifting substrate.
- ❑ CCTV can also be used to detect dye introduced into the sanitary sewer.
- ❑ CCTV inspections require specialized equipment and properly trained staff and are generally best left to specialized contractors or municipal public works staff.

### ***Illegal Dumping***

- ❑ Substances illegally dumped on streets and into the storm drain systems and creeks may include paints, used oil and other automotive fluids, construction debris, chemicals, fresh concrete, leaves, grass clippings, and pet wastes. These wastes can cause stormwater and receiving water quality problems as well as clog the storm drain system itself.
- ❑ Establish a system for tracking incidents. The system should be designed to identify the following:
  - ✓ Illegal dumping hot spots;
  - ✓ Types and quantities (in some cases) of wastes;
  - ✓ Patterns in time of occurrence (time of day/night, month, or year);
  - ✓ Mode of dumping (abandoned containers, “midnight dumping” from moving vehicles, direct dumping of materials, accidents/spills);
  - ✓ An anonymous tip/reporting mechanism; and
  - ✓ Evidence of responsible parties (e.g., tagging, encampments, etc.).
- ❑ One of the keys to success of reducing or eliminating illegal dumping is increasing the number of people at the facility who are aware of the problem and who have the tools to at least identify the incident, if not correct it. Therefore, train field staff to recognize and report the incidents.

Once a site has been cleaned:

- ❑ Post “No Dumping” signs with a phone number for reporting dumping and disposal.
- ❑ Landscaping and beautification efforts of hot spots may also discourage future dumping, as well as provide open space and increase property values.
- ❑ Lighting or barriers may also be needed to discourage future dumping.
- ❑ See fact sheet SC-11 Spill Prevention, Control, and Cleanup.



# Non-Stormwater Discharges **SC-10**

## *Inspection*

- ❑ Regularly inspect and clean up hot spots and other storm drainage areas where illegal dumping and disposal occurs.
- ❑ Conduct field investigations of the industrial storm drain system for potential sources of non-stormwater discharges.
- ❑ Pro-actively conduct investigations of high priority areas. Based on historical data, prioritize specific geographic areas and/or incident type for pro-active investigations.



## **Spill and Leak Prevention and Response**

- ❑ On paved surfaces, clean up spills with as little water as possible. Use a rag for small spills, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to a certified laundry (rags) or disposed of as hazardous waste.
- ❑ Never hose down or bury dry material spills. Sweep up the material and dispose of properly.
- ❑ Use adsorbent materials on small spills rather than hosing down the spill. Remove the adsorbent materials promptly and dispose of properly.
- ❑ For larger spills, a private spill cleanup company or Hazmat team may be necessary.
- ❑ See SC-11 Spill Prevention Control and Cleanup.



## **Employee Training Program**

- ❑ Training of technical staff in identifying and documenting illegal dumping incidents is required. The frequency of training must be presented in the SWPPP, and depends on site-specific industrial materials and activities.
- ❑ Consider posting a quick reference table near storm drains to reinforce training.
- ❑ Train employees to identify non-stormwater discharges and report discharges to the appropriate departments.
- ❑ Educate employees about spill prevention and cleanup.
- ❑ Well-trained employees can reduce human errors that lead to accidental releases or spills. The employee should have the tools and knowledge to immediately begin cleaning up a spill should one occur. Employees should be familiar with the Spill Prevention Control and Countermeasure Plan. Employees should be able to identify work/jobs with high potential for spills and suggest methods to reduce possibility.
- ❑ Determine and implement appropriate outreach efforts to reduce non-permissible non-stormwater discharges.

# Non-Stormwater Discharges SC-10

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- ☐ Conduct spill response drills annually (if no events occurred) in order to evaluate the effectiveness of the plan.
- ☐ When a responsible party is identified, educate the party on the impacts of his or her actions.



## **Quality Assurance and Record Keeping**

### *Performance Evaluation*

- ☐ Annually review internal investigation results; assess whether goals were met and what changes or improvements are necessary.
- ☐ Obtain feedback from personnel assigned to respond to, or inspect for, illicit connections and illegal dumping incidents.
- ☐ Develop document and data management procedures.
- ☐ A database is useful for defining and tracking the magnitude and location of the problem.
- ☐ Report prohibited non-stormwater discharges observed during the course of normal daily activities so they can be investigated, contained, and cleaned up or eliminated.
- ☐ Document that non-stormwater discharges have been eliminated by recording tests performed, methods used, dates of testing, and any on-site drainage points observed.
- ☐ Annually document and report the results of the program.
- ☐ Maintain documentation of illicit connection and illegal dumping incidents, including significant conditionally exempt discharges that are not properly managed.
- ☐ Document training activities.

## **Potential Limitations and Work-Arounds**

Some facilities may have space constraints, limited staffing and time limitations that may preclude implementation of BMPs. Provided below are typical limitations and recommended “work-arounds.”

- ☐ Many facilities do not have accurate, up-to-date ‘as-built’ plans or drawings which may be necessary in order to conduct non-stormwater discharge assessments.
  - ✓ Online tools such as Google Earth™ can provide an aerial view of the facility and may be useful in understanding drainage patterns and potential sources of non-stormwater discharges
  - ✓ Local municipal jurisdictions may have useful drainage systems maps.

## **Non-Stormwater Discharges SC-10**

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- ❑ Video surveillance cameras are commonly used to secure the perimeter of industrial facilities against break-ins and theft. These surveillance systems may also be useful for capturing illegal dumping activities. Minor, temporary adjustments to the field of view of existing surveillance camera systems to target known or suspected problem areas may be a cost-effective way of capturing illegal dumping activities and identifying the perpetrators.

### **Potential Capital Facility Costs and Operation & Maintenance Requirements**

#### ***Facilities***

- ❑ Capital facility cost requirements may be minimal unless cross-connections to storm drains are detected.
- ❑ Indoor floor drains may require re-plumbing if cross-connections are detected.
- ❑ Leaky sanitary sewers will require repair or replacement which can have significant costs depending on the size and industrial activity at the facility.

#### ***Maintenance (including administrative and staffing)***

- ❑ The primary effort is for staff time and depends on how aggressively a program is implemented.
- ❑ Costs for containment, and disposal of any leak or discharge is borne by the Discharger.
- ❑ Illicit connections can be difficult to locate especially if there is groundwater infiltration.
- ❑ Illegal dumping and illicit connection violations requires technical staff to detect and investigate them.

### **Supplemental Information**

#### ***Permit Requirements***

The IGP authorizes certain Non-Storm Water Discharges (NSWDs) provided BMPs are included in the SWPPP and implemented to:

- ❑ Reduce or prevent the contact of authorized NSWDs with materials or equipment that are potential sources of pollutants;
- ❑ Reduce, to the extent practicable, the flow or volume of authorized NSWDs;
- ❑ Ensure that authorized NSWDs do not contain quantities of pollutants that cause or contribute to an exceedance of a water quality standards (WQS); and,



## Non-Stormwater Discharges SC-10

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- ❑ Reduce or prevent discharges of pollutants in authorized NSWs in a manner that reflects best industry practice considering technological availability and economic practicability and achievability.”

### References and Resources

Center for Watershed Protection, 2004. *Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments*, EPA Cooperative Agreement X-82907801-0.

Dublin San Ramon Sanitation District. <http://www.dsrsd.com/wwwr/smoketest.html>.

Orange County Stormwater Program, Best Management Practices for Industrial/Commercial Business Activities. Available online at: <http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessesactivities>.

Sacramento Stormwater Management Program, *Best Management Practices for Industrial Storm Water Pollution Control*, Available online at: <http://www.msa.saccounty.net/sactostormwater/documents/guides/industrial-BMP-manual.pdf>.

Santa Clara Valley Urban Runoff Pollution Prevention Program. <http://www.scvurppp.org>.

Southern California Coastal Water Research Project, 2013. *The California Microbial Source Identification Manual: A Tiered Approach to Identifying Fecal Pollution Sources to Beaches*, Technical Report 804.

The Storm Water Managers Resource Center, <http://www.stormwatercenter.net/>.

US EPA. National Pollutant Discharge Elimination System. Available online at: [http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=factsheet\\_results&view=specific&bmp=111](http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=factsheet_results&view=specific&bmp=111).

WEF Press Alexandria, Virginia, 2009. Existing Sewer Evaluation and Rehabilitation: *WEF Manual of Practice No. FD-6 ASCE/EWRI Manuals and Reports on Engineering Practice No. 62, Third Edition*.

# Spill Prevention, Control & Cleanup SC-11

## Description

Many activities that occur at an industrial or commercial site have the potential to cause accidental spills. Preparation for accidental spills, with proper training and reporting systems implemented, can minimize the discharge of pollutants to the environment.

Spills and leaks are one of the largest contributors of stormwater pollutants. Spill prevention and control plans are applicable to any site at which hazardous materials are stored or used. An effective plan should have spill prevention and response procedures that identify hazardous material storage areas, specify material handling procedures, describe spill response procedures, and provide locations of spill clean-up equipment and materials. The plan should take steps to identify and characterize potential spills, eliminate and reduce spill potential, respond to spills when they occur in an effort to prevent pollutants from entering the stormwater drainage system, and train personnel to prevent and control future spills. An adequate supply of spill clean-up materials must be maintained onsite.

## Approach

### General Pollution Prevention Protocols

- ☐ Develop procedures to prevent/mitigate spills to storm drain systems.
- ☐ Develop and standardize reporting procedures, containment, storage, and disposal activities, documentation, and follow-up procedures.
- ☐ Establish procedures and/or controls to minimize spills and leaks. The procedures should address:
  - ✓ Description of the facility, owner and address, activities, chemicals, and quantities present;

### Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

### Targeted Constituents

Sediment

Nutrients

Trash

Metals ✓

Bacteria

Oil and Grease ✓

Organics ✓

### Minimum BMPs Covered

-  Good Housekeeping
-  Preventative Maintenance
-  Spill and Leak Prevention and Response ✓
-  Material Handling & Waste Management
-  Erosion and Sediment Controls
-  Employee Training Program ✓
-  Quality Assurance Record Keeping ✓



## Spill Prevention, Control & Cleanup SC-11

- ✓ Facility map of the locations of industrial materials;
  - ✓ Notification and evacuation procedures;
  - ✓ Cleanup instructions;
  - ✓ Identification of responsible departments; and
  - ✓ Identify key spill response personnel.
- ❑ Recycle, reclaim, or reuse materials whenever possible. This will reduce the amount of process materials that are brought into the facility.



### ***Spill and Leak Prevention and Response***

#### ***Spill Prevention***

- ❑ Develop procedures to prevent/mitigate spills to storm drain systems. Develop and standardize reporting procedures, containment, storage, and disposal activities, documentation, and follow-up procedures.
- ❑ If illegal dumping is observed at the facility:
  - ✓ Post “No Dumping” signs with a phone number for reporting illegal dumping and disposal. Signs should also indicate fines and penalties applicable for illegal dumping.
  - ✓ Landscaping and beautification efforts may also discourage illegal dumping.
  - ✓ Bright lighting and/or entrance barriers may also be needed to discourage illegal dumping.
- ❑ Store and contain liquid materials in such a manner that if the container is ruptured, the contents will not discharge, flow, or be washed into the storm drainage system, surface waters, or groundwater.
- ❑ If the liquid is oil, gas, or other material that separates from and floats on water, install a spill control device (such as a tee section) in the catch basins that collect runoff from the storage tank area.



#### ***Preventative Maintenance***

- ❑ Place drip pans or absorbent materials beneath all mounted taps, and at all potential drip and spill locations during filling and unloading of tanks. Any collected liquids or soiled absorbent materials must be reused/recycled or properly disposed.
- ❑ Store and maintain appropriate spill cleanup materials in a location known to all near the tank storage area; and ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.

## **Spill Prevention, Control & Cleanup SC-11**

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- ❑ Sweep and clean the storage area monthly if it is paved, *do not hose down the area to a storm drain*.
- ❑ Check tanks (and any containment sumps) daily for leaks and spills. Replace tanks that are leaking, corroded, or otherwise deteriorating with tanks in good condition. Collect all spilled liquids and properly dispose of them.
- ❑ Label all containers according to their contents (e.g., solvent, gasoline).
- ❑ Label hazardous substances regarding the potential hazard (corrosive, radioactive, flammable, explosive, poisonous).
- ❑ Prominently display required labels on transported hazardous and toxic materials (per US DOT regulations).
- ❑ Identify key spill response personnel.

### *Spill Response*

- ❑ Clean up leaks and spills immediately.
- ❑ Place a stockpile of spill cleanup materials where it will be readily accessible (e.g., near storage and maintenance areas).
- ❑ On paved surfaces, clean up spills with as little water as possible.
  - ✓ Use a rag for small spills, a damp mop for general cleanup, and absorbent material for larger spills.
  - ✓ If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to a certified laundry (rags) or disposed of as hazardous waste.
  - ✓ If possible use physical methods for the cleanup of dry chemicals (e.g., brooms, shovels, sweepers, or vacuums).
- ❑ Never hose down or bury dry material spills. Sweep up the material and dispose of properly.
- ❑ Chemical cleanups of material can be achieved with the use of adsorbents, gels, and foams. Use adsorbent materials on small spills rather than hosing down the spill. Remove the adsorbent materials promptly and dispose of properly.
- ❑ For larger spills, a private spill cleanup company or Hazmat team may be necessary.

## **Spill Prevention, Control & Cleanup SC-11**

### *Reporting*

- ❑ Report spills that pose an immediate threat to human health or the environment to the Regional Water Quality Control Board or local authority as location regulations dictate.
- ❑ Federal regulations require that any oil spill into a water body or onto an adjoining shoreline be reported to the National Response Center (NRC) at 800-424-8802 (24 hour).
- ❑ Report spills to 911 for dispatch and clean-up assistance when needed. Do not contact fire agencies directly.
- ❑ Establish a system for tracking incidents. The system should be designed to identify the following:
  - ✓ Types and quantities (in some cases) of wastes;
  - ✓ Patterns in time of occurrence (time of day/night, month, or year);
  - ✓ Mode of dumping (abandoned containers, “midnight dumping” from moving vehicles, direct dumping of materials, accidents/spills);
  - ✓ Clean-up procedures; and
  - ✓ Responsible parties.



### **Employee Training Program**

- ❑ Educate employees about spill prevention and cleanup.
- ❑ Well-trained employees can reduce human errors that lead to accidental releases or spills:
  - ✓ The employee should have the tools and knowledge to immediately begin cleaning up a spill should one occur; and
  - ✓ Employees should be familiar with the Spill Prevention Control and Countermeasure Plan.
- ❑ Employees should be educated about aboveground storage tank requirements. Employees responsible for aboveground storage tanks and liquid transfers should be thoroughly familiar with the Spill Prevention Control and Countermeasure Plan and the plan should be readily available.
- ❑ Train employees to recognize and report illegal dumping incidents.

## **Spill Prevention, Control & Cleanup SC-11**

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### ***Other Considerations (Limitations and Regulations)***

- ❑ State regulations exist for facilities with a storage capacity of 10,000 gallons or more of petroleum to prepare a Spill Prevention Control and Countermeasure (SPCC) Plan (Health & Safety Code Chapter 6.67).
- ❑ State regulations also exist for storage of hazardous materials (Health & Safety Code Chapter 6.95), including the preparation of area and business plans for emergency response to the releases or threatened releases.
- ❑ Consider requiring smaller secondary containment areas (less than 200 sq. ft.) to be connected to the sanitary sewer, prohibiting any hard connections to the storm drain.

### **Requirements**

#### ***Costs (including capital and operation & maintenance)***

- ❑ Will vary depending on the size of the facility and the necessary controls.
- ❑ Prevention of leaks and spills is inexpensive. Treatment and/or disposal of contaminated soil or water can be quite expensive.

#### ***Maintenance (including administrative and staffing)***

- ❑ Develop spill prevention and control plan, provide and document training, conduct inspections of material storage areas, and supply spill kits.
- ❑ Extra time is needed to properly handle and dispose of spills, which results in increased labor costs.

### **Supplemental Information**

#### ***Further Detail of the BMP***

##### ***Reporting***

Record keeping and internal reporting represent good operating practices because they can increase the efficiency of the facility and the effectiveness of BMPs. A good record keeping system helps the facility minimize incident recurrence, correctly respond with appropriate cleanup activities, and comply with legal requirements. A record keeping and reporting system should be set up for documenting spills, leaks, and other discharges, including discharges of hazardous substances in reportable quantities. Incident records describe the quality and quantity of non-stormwater discharges to the storm sewer. These records should contain the following information:

- ❑ Date and time of the incident;
- ❑ Weather conditions;
- ❑ Duration of the spill/leak/discharge;



## **Spill Prevention, Control & Cleanup SC-11**

- ☐ Cause of the spill/leak/discharge;
- ☐ Response procedures implemented;
- ☐ Persons notified; and
- ☐ Environmental problems associated with the spill/leak/discharge.

Separate record keeping systems should be established to document housekeeping and preventive maintenance inspections, and training activities. All housekeeping and preventive maintenance inspections should be documented. Inspection documentation should contain the following information:

- ☐ Date and time the inspection was performed;
- ☐ Name of the inspector;
- ☐ Items inspected;
- ☐ Problems noted;
- ☐ Corrective action required; and
- ☐ Date corrective action was taken.

Other means to document and record inspection results are field notes, timed and dated photographs, videotapes, and drawings and maps.

### *Aboveground Tank Leak and Spill Control*

Accidental releases of materials from aboveground liquid storage tanks present the potential for contaminating stormwater with many different pollutants. Materials spilled, leaked, or lost from tanks may accumulate in soils or on impervious surfaces and be carried away by stormwater runoff.

The most common causes of unintentional releases are:

- ☐ Installation problems;
- ☐ Failure of piping systems (pipes, pumps, flanges, couplings, hoses, and valves);
- ☐ External corrosion and structural failure;
- ☐ Spills and overfills due to operator error; and
- ☐ Leaks during pumping of liquids or gases from truck or rail car to a storage tank or vice versa.

## **Spill Prevention, Control & Cleanup SC-11**

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Storage of reactive, ignitable, or flammable liquids should comply with the Uniform Fire Code and the National Electric Code. Practices listed below should be employed to enhance the code requirements:

- ☐ Tanks should be placed in a designated area.
- ☐ Tanks located in areas where firearms are discharged should be encapsulated in concrete or the equivalent.
- ☐ Designated areas should be impervious and paved with Portland cement concrete, free of cracks and gaps, in order to contain leaks and spills.
- ☐ Liquid materials should be stored in UL approved double walled tanks or surrounded by a curb or dike to provide the volume to contain 10 percent of the volume of all of the containers or 110 percent of the volume of the largest container, whichever is greater. The area inside the curb should slope to a drain.
- ☐ For used oil or dangerous waste, a dead-end sump should be installed in the drain.
- ☐ All other liquids should be drained to the sanitary sewer if available. The drain must have a positive control such as a lock, valve, or plug to prevent release of contaminated liquids.
- ☐ Accumulated stormwater in petroleum storage areas should be passed through an oil/water separator.

Maintenance is critical to preventing leaks and spills. Conduct routine inspections and:

- ☐ Check for external corrosion and structural failure.
- ☐ Check for spills and overfills due to operator error.
- ☐ Check for failure of piping system (pipes, pumps, flanges, coupling, hoses, and valves).
- ☐ Check for leaks or spills during pumping of liquids or gases from truck or rail car to a storage facility or vice versa.
- ☐ Visually inspect new tank or container installation for loose fittings, poor welding, and improper or poorly fitted gaskets.
- ☐ Inspect tank foundations, connections, coatings, and tank walls and piping system. Look for corrosion, leaks, cracks, scratches, and other physical damage that may weaken the tank or container system.
- ☐ Frequently relocate accumulated stormwater during the wet season.



## **Spill Prevention, Control & Cleanup SC-11**

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- Periodically conduct integrity testing by a qualified professional.

### *Vehicle Leak and Spill Control*

Major spills on roadways and other public areas are generally handled by highly trained Hazmat teams from local fire departments or environmental health departments. The measures listed below pertain to leaks and smaller spills at vehicle maintenance shops.

In addition to implementing the spill prevention, control, and clean up practices above, use the following measures related to specific activities:

### *Vehicle and Equipment Maintenance*

- Perform all vehicle fluid removal or changing inside or under cover to prevent the run-on of stormwater and the runoff of spills.
- Regularly inspect vehicles and equipment for leaks, and repair immediately.
- Check incoming vehicles and equipment (including delivery trucks, and employee and subcontractor vehicles) for leaking oil and fluids. Do not allow leaking vehicles or equipment onsite.
- Always use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.
- Immediately drain all fluids from wrecked vehicles.
- Store wrecked vehicles or damaged equipment under cover.
- Place drip pans or absorbent materials under heavy equipment when not in use.
- Use absorbent materials on small spills rather than hosing down the spill.
- Remove the adsorbent materials promptly and dispose of properly.
- Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around.
- Oil filters disposed of in trashcans or dumpsters can leak oil and contaminate stormwater. Place the oil filter in a funnel over a waste oil recycling drum to drain excess oil before disposal. Oil filters can also be recycled. Ask your oil supplier or recycler about recycling oil filters.
- Store cracked batteries in a non-leaking secondary container. Do this with all cracked batteries, even if you think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure it is not leaking.

## **Spill Prevention, Control & Cleanup SC-11**

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### *Vehicle and Equipment Fueling*

- Design the fueling area to prevent the run-on of stormwater and the runoff of spills:

Cover fueling area if possible.

Use a perimeter drain or slope pavement inward with drainage to a sump.

Pave fueling area with concrete rather than asphalt.

- If dead-end sump is not used to collect spills, install an oil/water separator.
- Install vapor recovery nozzles to help control drips as well as air pollution.
- Discourage “topping-off” of fuel tanks.
- Use secondary containment when transferring fuel from the tank truck to the fuel tank.
- Use absorbent materials on small spills and general cleaning rather than hosing down the area. Remove the absorbent materials promptly.
- Carry out all Federal and State requirements regarding underground storage tanks, or install above ground tanks.
- Do not use mobile fueling of mobile industrial equipment around the facility; rather, transport the equipment to designated fueling areas.
- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Train employees in proper fueling and cleanup procedures.

### ***Industrial Spill Prevention Response***

For the purposes of developing a spill prevention and response program to meet the stormwater regulations, facility managers should use information provided in this fact sheet and the spill prevention/response portions of the fact sheets in this handbook, for specific activities.

The program should:

- Integrate with existing emergency response/hazardous materials programs (e.g., Fire Department).
- Develop procedures to prevent/mitigate spills to storm drain systems.
- Identify responsible departments.

## **Spill Prevention, Control & Cleanup SC-11**

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- ❑ Develop and standardize reporting procedures, containment, storage, and disposal activities, documentation, and follow-up procedures.
- ❑ Address spills at municipal facilities, as well as public areas.
- ❑ Provide training concerning spill prevention, response and cleanup to all appropriate personnel.

### **References and Resources**

California's Nonpoint Source Program Plan. <http://www.swrcb.ca.gov/nps/index.html>.

Clark County Storm Water Pollution Control Manual. Available online at:  
<http://www.co.clark.wa.us/pubworks/bmpman.pdf>.

King County Storm Water Pollution Control Manual. Available online at:  
<http://dnr.metrokc.gov/wlr/dss/spcm.htm>.

Orange County Stormwater Program, Best Management Practices for Industrial/Commercial Business Activities. Available online at:  
<http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessesactivities>

Santa Clara Valley Urban Runoff Pollution Prevention Program.  
<http://www.scvurppp.org>.

The Stormwater Managers Resource Center. <http://www.stormwatercenter.net/>.

# Vehicle and Equipment Fueling SC-20

## Description

Spills and leaks that occur during vehicle and equipment fueling can contribute hydrocarbons, oil and grease, as well as heavy metals, to stormwater runoff. Implementing the following management practices can help prevent fuel spills and leaks.

## Approach

- ❑ Reduce potential for pollutant discharge through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

## General Pollution Prevention Protocols

- ❑ Use properly maintained off-site fueling stations whenever possible. These businesses are better equipped to handle fuel and spills properly.
- ❑ Focus pollution prevention activities on containment of spills and leaks, most of which may occur during liquid transfers.



## Good Housekeeping

- ❑ "Spot clean" leaks and drips routinely. Leaks are not cleaned up until the absorbent is picked up and disposed of properly.
- ❑ Manage materials and waste properly (see Material Handling and Waste Management) to reduce adverse impacts on stormwater quality.
- ❑ Paint signs on storm drain inlets to indicate that they are not to receive liquid or solid wastes.
- ❑ Post signs at sinks to remind employees not to pour wastes down drains.

## Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

## Targeted Constituents

Sediment	
Nutrients	
Trash	✓
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

## Minimum BMPs Covered

 Good Housekeeping	✓
 Preventative Maintenance	✓
 Spill and Leak Prevention and Response	✓
 Material Handling & Waste Management	✓
 Erosion and Sediment Controls	
 Employee Training Program	✓
 Quality Assurance Record Keeping	✓



## Vehicle and Equipment Fueling SC-20

- ❑ Clean yard storm drain inlets(s) regularly and especially after large storms.
- ❑ Do not pour materials down storm drains.
- ❑ Build a shed or temporary roof over fueling area to limit exposure to rain.
- ❑ Post signs to remind employees and customers not to top off the fuel tank when filling and signs that ban customers and employees from changing engine oil or other fluids at that location.
- ❑ Report leaking vehicles to fleet maintenance.
- ❑ Ensure the following safeguards are in place:
  - ✓ Overflow protection devices on tank systems to warn the operator or automatically shut down transfer pumps when the tank reaches full capacity.
  - ✓ Protective guards around tanks and piping to prevent vehicle or forklift damage.
  - ✓ Clear tagging or labeling of all valves to reduce human error.
  - ✓ Emergency shut-off and emergency phone number.



### ***Preventative Maintenance***

#### ***Fuel Dispensing Areas***

- ❑ Inspect vehicles and equipment for leaks regularly and repair immediately.
- ❑ Sweep the fueling area weekly, if it is paved, to collect loose particles, and wipe up spills with rags and other absorbent material immediately. Do not hose down the area to a storm drain.
- ❑ Fit underground storage tanks with spill containment and overfill prevention systems meeting the requirements of Section 2635(b) of Title 23 of the California Code of Regulations.
- ❑ Fit fuel dispensing nozzles with "hold-open latches" (automatic shutoffs) except where prohibited by local fire departments.
- ❑ Post signs at the fuel dispenser or fuel island warning vehicle owners/operators against "topping off" of vehicle fuel tanks.
- ❑ Design fueling area to prevent stormwater runoff and spills. Use a perimeter drain or slope pavement inward with drainage to sump; regularly remove materials accumulated in sump.
- ❑ Pave area with concrete rather than asphalt.

## Vehicle and Equipment Fueling SC-20

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- ❑ Cover fueling area with an overhanging roof structure or canopy so that precipitation cannot come in contact with the fueling area. Where covering is not feasible and the fuel island is surrounded by pavement, apply a suitable sealant that protects the asphalt from spilled fuels.
- ❑ Install vapor recovery nozzles to help control drips as well as air pollution.
- ❑ Use secondary containment when transferring fuel from the tank truck to the fuel tank. Cover storm drains in the vicinity during transfer.

### *Air/Water Supply Area*

- ❑ Minimize the possibility of stormwater pollution from air/water supply areas by doing at least one of the following:
  - ✓ Spot clean leaks and drips routinely to prevent runoff of spillage.
  - ✓ Grade and pave the air/water supply area to prevent run-on of stormwater.
  - ✓ Install a roof over the air/water supply area.
  - ✓ Install a low containment berm around the air/water supply area.

### *Inspection*

- ❑ Aboveground Tank Leak and Spill Control:
  - ✓ Check for external corrosion and structural failure.
  - ✓ Check for spills and overfills due to operator error.
  - ✓ Check for failure of piping system.
  - ✓ Check for leaks or spills during pumping of liquids or gases from truck or rail car to a storage facility or vice versa.
  - ✓ Visually inspect new tank or container installation for loose fittings, poor welding, and improper or poorly fitted gaskets.
  - ✓ Inspect tank foundations, connections, coatings, and tank walls and piping system. Look for corrosion, leaks, cracks, scratches, and other physical damage that may weaken the tank or container system.
  - ✓ Conduct integrity testing periodically by a qualified professional.
- ❑ Inspect and clean, if necessary, storm drain inlets and catch basins within the facility boundary before October 1 each year.



# Vehicle and Equipment Fueling SC-20



## ***Spill Response and Prevention Procedures***

- ❑ Keep your spill prevention and control plan up-to-date.
- ❑ Maintain an adequate stockpile of spill cleanup materials at locations where it will be readily accessible.
- ❑ Clean leaks, drips, and other spills with as little water as possible.
  - ✓ Use rags for small spills,
  - ✓ Use a damp mop for general cleanup,
  - ✓ Use dry absorbent material for larger spills.
- ❑ Use the following three-step method for cleaning floors:
  - ✓ Clean spills with rags or other absorbent materials
  - ✓ Sweep floor using dry absorbent material
  - ✓ Mop the floor. Mop water may be discharged to the sanitary sewer via a toilet or sink.
- ❑ Remove the adsorbent materials promptly and dispose of properly when using absorbent materials on small spills.
- ❑ Store portable absorbent booms (long flexible shafts or barriers made of absorbent material) in unbermed fueling areas.
- ❑ Report spills promptly.
- ❑ If a dead-end sump is not used to collect spills, install an oil/water separator.



## ***Material Handling and Waste Management***

- ❑ Do not pour liquid wastes into floor drains, sinks, outdoor storm drain inlets, or other storm drains or sewer connections.
- ❑ Do not put used or leftover cleaning solutions, solvents, and automotive fluids in the sanitary sewer.
- ❑ Collect leaking or dripping fluids in drip pans or containers. Fluids are easier to recycle if kept separate.
- ❑ Promptly transfer used fluids to the proper waste or recycling drums. Do not leave drip pans or other open containers lying around.

## **Vehicle and Equipment Fueling SC-20**

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- ❑ Minimize the possibility of stormwater pollution from outside waste receptacles by doing at least one of the following:
  - ✓ Use only watertight waste receptacle(s) and keep the lid(s) closed.
  - ✓ Grade and pave the waste receptacle area to prevent run-on of stormwater.
  - ✓ Install a roof over the waste receptacle area.
  - ✓ Install a low containment berm around the waste receptacle area.
  - ✓ Use and maintain drip pans under waste receptacles.
- ❑ Post “no littering” signs.



### ***Employee Training Program***

- ❑ Educate employees about facility-wide pollution prevention measures and goals.
- ❑ Train designated employees (e.g., those involved with the handling or management of fuels) on proper fueling and cleanup procedures.
- ❑ Train designated employees upon hiring and annually thereafter on proper methods for handling and disposing of waste. Make sure that all employees understand stormwater discharge prohibitions, wastewater discharge requirements, and these best management practices.
- ❑ Ensure that employees are familiar with the site’s spill control plan and/or proper spill cleanup procedures.
- ❑ Use a training log or similar method to document training. The training log should include entries for:
  - ✓ Training topic,
  - ✓ Trainer,
  - ✓ Attendees,
  - ✓ Frequency,
  - ✓ Comments,
  - ✓ Target date for completion of training, and
  - ✓ Date completed.



# Vehicle and Equipment Fueling SC-20



## **Quality Assurance and Record Keeping**

- ❑ Keep accurate maintenance logs that document minimum BMP activities performed for vehicle and equipment fueling, quantities of materials removed, and improvement actions.
- ❑ Keep accurate logs of spill response actions that document what types of liquids were spilled, how it was cleaned up, and how the waste was disposed.
- ❑ Establish procedures to complete logs and file them in the central office.

## **Potential Capital Facility Costs and Operation & Maintenance Requirements**

### ***Facilities***

- ❑ The retrofitting of existing fueling areas to minimize stormwater exposure or spill runoff can be expensive. Good design must occur during the initial installation. Extruded curb along the “upstream” side of the fueling area to prevent stormwater run-on is of modest cost.
- ❑ Capital investments will likely be required at some sites if adequate cover and containment facilities do not exist and can vary significantly depending upon site conditions.

### ***Maintenance***

- ❑ Most of the operations and maintenance activities associated with implementing this BMP are integrally linked to routine operations as previously described. Therefore additional O&M is not required.
- ❑ For facilities responsible for pre-treating their wastewater prior to discharging, the proper functioning of structural treatment system is an important maintenance consideration.
- ❑ Routine cleanout of sumps and oil/water separators is required for the devices to maintain their effectiveness, usually at least once a month. During periods of heavy rainfall, cleanout is required more often to ensure pollutants are not washed through the system. Sediment removal is also required on a regular basis to keep the device working efficiently.

## **Supplemental Information**

### ***Designing New Installations***

The elements listed below should be included in the design and construction of new or substantially remodeled facilities.

### ***Fuel Dispensing Areas***

- ❑ Fuel dispensing areas must be paved with Portland cement concrete (or, equivalent smooth impervious surface), with a 2 to 4% slope to prevent ponding, and must be

## Vehicle and Equipment Fueling SC-20

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separated from the rest of the site by a grade break that prevents run-on of stormwater to the extent practicable. The fuel dispensing area is defined as extending 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assembly may be operated plus 1 foot, whichever is less. The paving around the fuel dispensing area may exceed the minimum dimensions of the "fuel dispensing area" stated above.

- The fuel dispensing area must be covered, and the cover's minimum dimensions must be equal to or greater than the area within the grade break or the fuel dispensing area, as defined above. The cover must not drain onto the fuel dispensing area.
- If necessary, install and maintain an oil control device in the appropriate catch basin(s) to treat runoff from the fueling area.

### *Outdoor Waste Receptacle Area*

- Grade and pave the outdoor waste receptacle area to prevent run-on of stormwater to the extent practicable.

### *Air/Water Supply Area*

- Grade and pave the air/water supply area to prevent run-on of stormwater to the extent practicable.

### *Designated Fueling Area*

- If your facility has large numbers of mobile equipment working throughout the site and you currently fuel them with a mobile fuel truck, consider establishing a designated fueling area. With the exception of tracked equipment such as bulldozers and perhaps small forklifts, most vehicles should be able to travel to a designated area with little lost time. Place temporary "caps" over nearby catch basins or manhole covers so that if a spill occurs it is prevented from entering the storm drain.

### ***Examples***

The Spill Prevention Control and Countermeasure (SPCC) Plan, which is required by law for some facilities, is an effective program to reduce the number of accidental spills and minimize contamination of stormwater runoff.

The City of Palo Alto has an effective program for commercial vehicle service facilities. Many of the program's elements, including specific BMP guidance and lists of equipment suppliers, are also applicable to industrial facilities.

### **References and Resources**

Orange County Stormwater Program, Best Management Practices for Industrial/Commercial Business Activities. Available online at:

<http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessactivities>.

## **Vehicle and Equipment Fueling SC-20**

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Oregon Department of Environmental Quality, 2013. *Industrial Stormwater Best Management Practices Manual- BMP 8 Vehicle, Pavement and Building Washing*. Available online at: <http://www.deq.state.or.us/wq/wqpermit/docs/IndBMP021413.pdf>

Sacramento Stormwater Management Program. *Best Management Practices for Industrial Storm Water Pollution Control*. Available online at: <http://www.msa.saccounty.net/sactostormwater/documents/guides/industrial-BMP-manual.pdf>.

Sacramento County Environmental Management Stormwater Program: Best Management Practices –Vehicle Washing. Available online at: <http://www.emd.saccounty.net/EnvHealth/Stormwater/Stormwater-BMPs.html>.

Santa Clara Valley Urban Runoff Pollution Prevention Program. <http://www.scvurppp-w2k.com/>.

US EPA. National Pollutant Discharge Elimination System – Stormwater Menu of BMPs - Municipal Vehicle and Equipment Washing, Available online at: <http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=browse&Rbutton=detail&bmp=132>.

Washington State Department of Ecology, 2012. *Vehicle and Equipment Washwater Discharges Best Management Practices Manual*. Publication no. WQ-R-95-056. Available online at: <https://fortress.wa.gov/ecy/publications/publications/95056.pdf>.

# Vehicle and Equipment Cleaning SC-21

## Description

Wash water from vehicle and equipment cleaning activities performed outdoors or in areas where wash water flows onto the ground can contribute toxic hydrocarbons and other organic compounds, oils and greases, nutrients, phosphates, heavy metals, and suspended solids to stormwater runoff. Use of the procedures outlined below can prevent or reduce the discharge of pollutants to stormwater during vehicle and equipment cleaning.

## Approach

Reduce potential for pollutant discharge through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives

### General Pollution Prevention Protocols

- ☐ If possible, use properly maintained off-site commercial washing and steam cleaning businesses whenever possible. These businesses are better equipped to handle and properly dispose of the wash waters.
- ☐ Use dry cleaning methods to remove debris and sweep area; avoid washing with water when possible.
- ☐ Good housekeeping practices can minimize the risk of contamination from wash water discharges.
- ☐ Use biodegradable, phosphate-free detergents for washing vehicles as appropriate
- ☐ Emphasize the connection between the storm drain system and runoff, help reinforce that vehicle and equipment washing activities affect local water quality through storm drain stenciling programs.

## Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

## Targeted Constituents

<i>Sediment</i>	✓
<i>Nutrients</i>	✓
<i>Trash</i>	
<i>Metals</i>	✓
<i>Bacteria</i>	
<i>Oil and Grease</i>	✓
<i>Organics</i>	✓

## Minimum BMPs Addressed

	<i>Good Housekeeping</i>	✓
	<i>Preventative Maintenance</i>	✓
	<i>Spill and Leak Prevention and Response</i>	✓
	<i>Material Handling &amp; Waste Management</i>	✓
	<i>Erosion and Sediment Controls</i>	
	<i>Employee Training Program</i>	✓
	<i>Quality Assurance Record Keeping</i>	✓



# Vehicle and Equipment Cleaning SC-21

- Map on-site storm drain locations to avoid discharges to the storm drain system.
- Designate specific wash area with clarifier or place wash areas away from storm drain connections.



## ***Good Housekeeping***

- Mark the area clearly as a wash area by:
  - ✓ Posting signs stating that only washing is allowed in wash area; and
  - ✓ Providing information on how washing is to be done.
- Provide trash containers in wash area.
- Have all vehicle and equipment washing done in areas designed to collect and hold the wash and rinse water or effluent generated. Recycle, collect or treat wash water effluent prior to discharge to the sanitary sewer system.
- If washing/cleaning must occur on-site, consider washing vehicles and equipment inside the building or on an impervious surface to control the targeted constituents by directing them to the sanitary sewer.
- If washing must occur on-site and outdoor:
  - ✓ Use designated paved wash areas. This area must be covered or bermed to collect the wash water and graded to direct the wash water to a treatment or disposal facility.
  - ✓ Do not conduct oil changes and other engine maintenance in the designated washing area. Perform these activities in a place designated for oil change and maintenance activities.
  - ✓ Cover the wash area when not in use to prevent contact with rain water.
- Do not permit steam cleaning wash water to enter the storm drain system.
- If possible, conduct pressure and steam cleaning at appropriate off-site areas to avoid generating runoff with high pollutant concentrations.



## ***Preventative Maintenance***

- Install sumps or drain lines to collect wash water for treatment.
- Use hoses with nozzles that automatically turn off when left unattended.
- Perform routine inspections of drain lines, holding tanks, and hoses and repair leaks immediately.



# Vehicle and Equipment Cleaning SC-21

- ☐ Perform routine inspection and maintenance of wash water recycling and treatment systems.



## ***Spill Response and Prevention Procedures***

- ☐ Keep the spill prevention and control plan up-to-date.
- ☐ Have an emergency plan, equipment, and trained personnel ready at all times to deal immediately with major spills.
- ☐ Collect all spilled liquids and properly dispose of them.
- ☐ Store and maintain appropriate spill cleanup materials in a location known to all near the designated wash area.



## ***Material Handling and Waste Management***

- ☐ Collect all wash water from vehicle and equipment cleaning operations. Consider treating and reusing or discharging wash waters to a sanitary sewer system.
- ☐ Large quantities of wash waters may require treatment at the facility. Treatment using a process treatment system (e.g., holding tank, filtration system, and related appurtenances) will require engineering and capital expenditures.
- ☐ Collect and treat small amounts of wash water at the facility and either recycle or discharge to the sanitary sewer system or collect and dispose of as an industrial waste.
- ☐ Discharge wash waters into sanitary sewer only after contacting local sewer authority to find out if pretreatment is required.



## ***Employee Training Program***

- ☐ Train employees on proper cleaning and wash water disposal procedures and conduct “refresher” courses on a regular basis.
- ☐ Train staff on proper maintenance measures for the wash area.
- ☐ Train employees and contractors on proper spill containment and cleanup. The employee should have the tools and knowledge to immediately begin cleaning up a spill should one occur.
- ☐ Use a training log or similar method to document training.



## ***Quality Assurance and Record Keeping***

- ☐ Keep accurate maintenance/inspection logs that document the minimum BMP activities performed for vehicle and equipment cleaning activities and improvement actions.

# Vehicle and Equipment Cleaning SC-21

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- ❑ Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.
- ❑ Establish procedures to complete logs and file them in the central office.

## Other Facility-Specific Considerations

- ❑ Some municipalities may require pretreatment and monitoring of wash water discharges to the sanitary sewer.
- ❑ Steam cleaning can generate significant pollutant concentrations requiring that careful consideration be given to the environmental impacts and compliance issues related to the condensate wastewater generated.

## Potential Limitations and Work-Arounds

Some facilities may have space constraints, limited staffing and time limitations that may preclude implementation of certain BMPs. Provided below are typical limitations and recommended “work-arounds”:

- ❑ Most car washing best management practices are inexpensive, and rely more on good housekeeping practices (where vehicles are washed, planning for the collection of wash water) than on expensive technology. However, the construction of a specialized area for vehicle washing can be expensive. Also, for facilities that cannot recycle their wash water, the cost of pre-treating wash water through either structural practices or planning for collection and hauling of contaminated water to sewage treatment plants can be cost-prohibitive.
- ❑ A potential work-around is to use properly maintained off-site commercial washing and steam cleaning businesses whenever possible.

## Potential Capital Facility Costs and Operation & Maintenance Requirements

### *Facilities*

- ❑ Many facilities will already have indoor covered areas where vehicle and equipment cleaning takes place and will require no additional capital expenditures for providing cover.
- ❑ Capital investments will be required at some sites if systems to collect and recycle/treat and properly discharge wash water are not in place. The cost associated with these investments will vary depending on the size of the washing facility and local regulations regarding effluent wash water.

### *Maintenance*

- ❑ Perform wash and collection system inspections and repair.
- ❑ Sweep washing areas frequently to remove solid debris.

## **Vehicle and Equipment Cleaning SC-21**

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- Repair berms and dikes as necessary.
- Inspect and maintain sumps, oil/water separators, and on-site treatment/recycling units.

### **Supplemental Information**

#### ***Designated Cleaning Areas***

- Washing operations outside should be conducted in a designated wash area having the following characteristics:
  - ✓ Paved with Portland cement concrete
  - ✓ Covered and bermed to prevent contact with stormwater and contain wash water
  - ✓ Sloped for wash water collections
  - ✓ Drainage system for wash water to the sanitary or recycle treatment process waste sewer, or to a dead-end sump equipped with an oil/water separator if necessary.

### **References and Resources**

Orange County Stormwater Program, Best Management Practices for Industrial/Commercial Business Activities. Available online at: <http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessactivities>.

Oregon Department of Environmental Quality, 2013. *Industrial Stormwater Best Management Practices Manual- BMP 8 Vehicle, Pavement and Building Washing*. Available online at: <http://www.deq.state.or.us/wq/wqpermit/docs/IndBMP021413.pdf>.

Sacramento Stormwater Management Program. *Best Management Practices for Industrial Storm Water Pollution Control*. Available online at: <http://www.msa.saccounty.net/sactostormwater/documents/guides/industrial-BMP-manual.pdf>.

Sacramento County Environmental Management Stormwater Program: Best Management Practices –Vehicle Washing. Available online at: <http://www.emd.saccounty.net/EnvHealth/Stormwater/Stormwater-BMPs.html>.

Santa Clara Valley Urban Runoff Pollution Prevention Program. <http://www.scvurppp-w2k.com/>.

US EPA. National Pollutant Discharge Elimination System – Stormwater Menu of BMPs - Municipal Vehicle and Equipment Washing. Available online at: <http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=browse&Rbut ton=detail&bmp=132>.



## **Vehicle and Equipment Cleaning SC-21**

Washington State Department of Ecology, 2012 .*Vehicle and Equipment Washwater Discharges Best Management Practices Manual*. Publication no. WQ-R-95-056.  
Available online at: <https://fortress.wa.gov/ecy/publications/publications/95056.pdf>.

# Vehicle and Equipment Repair SC-22

## Description

Vehicle or equipment maintenance and repair are potentially significant sources of stormwater pollution, due to use of harmful materials and wastes during maintenance and repair processes. Engine repair and service (e.g., parts cleaning), replacement of fluids (e.g., oil change), and outdoor equipment storage and parking (leaking vehicles) can impact water quality if stormwater runoff from areas with these activities becomes polluted by a variety of contaminants. Implementation of the following activities must be done where applicable to prevent or reduce the discharge of pollutants to stormwater from vehicle and equipment maintenance and repair activities.

## Approach

The BMP approach is to reduce the potential for pollutant discharges through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives. General pollution prevention protocols are presented followed by applicable minimum BMPs as required by the Industrial General Permit.

### General Pollution Prevention Protocols

- ☐ Designate a vehicle maintenance area designed to prevent stormwater pollution.
- ☐ Minimize contact of stormwater with outside operations through berming and appropriate drainage routing.
- ☐ Keep accurate maintenance logs to evaluate materials removed and improvements made.
- ☐ Switch to non-toxic chemicals for maintenance when possible.
- ☐ Choose cleaning agents that can be recycled.
- ☐ Use drop cloths and drip pans.

## Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

## Targeted Constituents

Sediment

Nutrients

Trash

Metals ✓

Bacteria

Oil and Grease ✓

Organics ✓

## Minimum BMPs Covered

	Good Housekeeping	✓
	Preventative Maintenance	✓
	Spill and Leak Prevention and Response	✓
	Material Handling & Waste Management	✓
	Erosion and Sediment Controls	
	Employee Training Program	✓
	Quality Assurance Record Keeping	✓



# Vehicle and Equipment Repair SC-22

- ☐ Minimize use of solvents. Clean parts without using solvents whenever possible, or use water-based solvents for cleaning.
- ☐ Recycle used motor oil, diesel oil, and other vehicle fluids and parts whenever possible.

## ***Operational Protocols***

### *General*

- ☐ Move maintenance and repair activities indoors whenever feasible.
- ☐ Place curbs around the immediate boundaries of process equipment.



### ***Good Housekeeping***

- ☐ Store idle equipment under cover
- ☐ Use a vehicle maintenance area designed to prevent stormwater pollution - minimize contact of stormwater with outside operations through berming and appropriate drainage routing.
- ☐ Avoid hosing down your work areas. If work areas are washed, collect and direct wash water to sanitary sewer. Use dry sweeping if possible.
- ☐ Paint signs on storm drain inlets to indicate that they are not to receive liquid or solid wastes.
- ☐ Post signs at sinks to remind employees not to pour wastes down drains.
- ☐ Clean yard storm drain inlets(s) regularly and especially after large storms.
- ☐ Do not pour materials down storm drains.
- ☐ Cover the work area to limit exposure to rain.
- ☐ Place curbs around the immediate boundaries of process equipment.
- ☐ Build a shed or temporary roof over areas where parked cars await repair or salvage, especially wrecked vehicles. Build a roof over vehicles kept for parts.



### ***Preventive Maintenance and Repair Activities***

- ☐ Provide a designated area for vehicle maintenance.
- ☐ Inspect vehicles and equipment for leaks regularly and repair immediately.
- ☐ Make sure incoming vehicles are checked for leaking oil and fluids. Do not allow leaking vehicles or equipment on-site without correcting the source of the leak and cleaning up any spill.
- ☐ Keep equipment clean; don't allow excessive build-up of oil and grease.

## **Vehicle and Equipment Repair SC-22**

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- ❑ Perform all vehicle fluid removal or changing inside or under cover if possible to prevent the run-on of stormwater and the runoff of spills.
- ❑ Use a tarp, ground cloth, or drip pans beneath the vehicle or equipment to capture all spills and drips if temporary work is being conducted outside. Collected drips and spills must be disposed, reused, or recycled properly.
- ❑ It is important to sweep the maintenance area weekly, if it is paved, to collect loose particles, and wipe up spills with rags and other absorbent material immediately. Do not hose down the area to a storm drain.
- ❑ Establish standard procedures to prevent spillage/leakage of fluids including:
  - ✓ Keep a drip pan under the vehicle while you unclip hoses, unscrew filters, or remove other parts. Use a drip pan under any vehicle that might leak while working on it to keep splatters or drips off the shop floor.
  - ✓ Promptly transfer used fluids to the proper waste or recycling drums. Do not leave drip pans or other open containers lying around.
  - ✓ Keep drip pans or containers under vehicles or equipment that may drip during repairs.
  - ✓ Do not change motor oil or perform equipment maintenance in non-appropriate areas.
- ❑ Drain oil and other fluids first if the vehicle or equipment is to be stored outdoors. Elevate and tarp stored vehicles and equipment.
- ❑ Monitor parked vehicles closely for leaks. Pans should be placed under any leaks to collect the fluids for proper disposal or recycling.
- ❑ Mechanics should clean vehicle parts without using liquid cleaners wherever possible to reduce waste.
- ❑ Steam cleaning and pressure washing may be used instead of solvent parts cleaning. The wastewater generated from steam cleaning must be discharged to an on-site oil water separator that is connected to a sanitary sewer or blind sump. Non-caustic detergents should be used instead of caustic cleaning agents, detergent-based or water-based cleaning systems in place of organic solvent degreasers, and non-chlorinated solvent in place of chlorinated organic solvents for parts cleaning. Refer to SC21 for more information on steam cleaning.
- ❑ Fifth-wheel bearings on trucks require routine lubrication. Typically chassis grease is applied to the fifth-wheel bearing at rates that result in grease dripping off of the bearing into the environment. To address this concern the following options are available:
  - ✓ Use specialized lubricants with good adhesion (e.g., stay in place) properties. Carefully follow manufacturer's label regarding the use of adhesive lubricant for

## Vehicle and Equipment Repair SC-22

truck fifth-wheels. Typically this means applying no more than 8 oz. of grease. No visible extrusion of lubricant from the fifth-wheel bearing when truck and trailer are connected should be present.

- ✓ Use on-board truck or on-board trailer automatic lubrication systems. If these systems apply lube thinner than National Grease Lubrication Institute #2, equipment for collection of used lubricant is needed to prevent excess lubricant from dripping off the truck.
- ✓ Use plastic or Teflon plates instead of grease or other lubricants. Carefully follow manufacturer's instructions for installation and operation.
- Use one of the following for lubricating vehicle-trailer coupling:
  - ✓ Specialized adhesive lubricants;
  - ✓ Grease-free fifth wheel slip plates (e.g., plastic or Teflon coatings); and
  - ✓ On-Board automatic lubricating systems.



### ***Spill and Leak Prevention and Response Procedures***

- Keep your spill prevention and control plan up-to-date.
- Place an adequate stockpile of spill cleanup materials where it will be readily accessible.
- Clean leaks, drips, and other spills with as little water as possible. Use rags for small spills, a damp mop for general cleanup, and dry absorbent material for larger spills. Use the following three-step method for cleaning floors:
  - ✓ Clean spills with rags or other absorbent materials;
  - ✓ Sweep floor using dry absorbent material; and
  - ✓ Mop the floor.

Mop water may be discharged to the sanitary sewer via a toilet or sink.

- Remove the adsorbent materials promptly and dispose of properly when using adsorbent materials on small spills.



### ***Material Handling and Waste Management***

- Designate a special area to drain and replace motor oil, coolant, and other fluids, where there are no connections to the storm drain or the sanitary sewer, and drips and spills can be easily cleaned up.
- Drain all fluids immediately from wrecked vehicles. Ensure that the drain pan or drip pan is large enough to contain drained fluids (e.g., larger pans are needed to contain antifreeze, which may gush from some vehicles).

## Vehicle and Equipment Repair SC-22

- ☐ Do not pour liquid waste to floor drains, sinks, outdoor storm drain inlets, or other storm drains or sewer connections.
- ☐ Do not put used or leftover cleaning solutions, solvents, and automotive fluids and in the sanitary sewer.
- ☐ Collect leaking or dripping fluids in drip pans or containers. Fluids are easier to recycle if kept separate.
- ☐ Promptly transfer used fluids to the proper waste or recycling drums. Do not leave drip pans or other open containers lying around.
- ☐ Place oil filter in a funnel over a waste oil recycling drum to drain excess oil before disposal since municipalities prohibit or discourage disposal of these items in solid waste facilities.
- ☐ Oil filters can also be recycled. Ask your oil supplier or recycler about recycling oil filters. Oil filters disposed of in trashcans or dumpsters can leak oil and contaminate stormwater.
- ☐ Store cracked batteries in a non-leaking secondary container and dispose of properly at recycling or household hazardous waste facilities.



### ***Employee Training Program***

- ☐ Train employees and contractors in the proper handling and disposal of engine fluids and waste materials.
- ☐ Employees should have the tools and knowledge to immediately begin cleaning up a spill should one occur.
- ☐ Conduct annual training to ensure that employees are familiar with the facility's spill control plan and/or proper spill cleanup procedures (You can use reusable cloth rags to clean up small drips and spills instead of disposables; these can be washed by a permitted industrial laundry. Do not clean them at home or at a coin-operated laundry business).
- ☐ Use a training log or similar method to document training.



### ***Quality Assurance and Recordkeeping***

- ☐ Keep accurate maintenance logs to evaluate materials removed and improvements made.
- ☐ Establish procedures to collect and file maintenance logs in the central office.



# Vehicle and Equipment Repair SC-22

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## ***Other Facility-Specific Considerations***

### ***Parts Cleaning***

Vehicle and equipment maintenance facilities often must clean parts as a part of day-to-day operations. The following activities should be considered:

- ❑ Clean vehicle parts without using liquid cleaners wherever possible to reduce waste.
- ❑ Steam cleaning and pressure washing may be used instead of solvent parts cleaning.
- ❑ Wastewater generated from steam cleaning must be discharged to an on-site oil water separator that is connected to a sanitary sewer or blind sump.
- ❑ Use non-caustic detergents instead of caustic cleaning agents, detergent-based or water-based cleaning systems in place of organic solvent degreasers, and non-chlorinated solvent in place of chlorinated organic solvents for parts cleaning. Refer to SC21 for more information on steam cleaning.

### ***Potential Limitations and Work-Arounds***

- ❑ Some facilities may have space constraints and time limitations that may preclude all work from being conducted indoors.
  - ✓ Designate specific areas for outdoor activities.
  - ✓ Require employees to understand and follow preventive maintenance and spill and leak prevention BMPs.
- ❑ It may not be possible to contain and clean up spills from vehicles/equipment brought on-site after working hours.
  - ✓ Provide a designated area for afterhours deliveries.
  - ✓ Install spill kits.
- ❑ Drain pans (usually 1 ft. x 1 ft.) are generally too small to contain antifreeze
  - ✓ Purchase or fabricate large drip pans (3 ft. x 3 ft.) with sufficient volume to contain expected quantities of liquids based on equipment/vehicle specifications.
- ❑ Dry floor cleaning methods may not be sufficient for some spills.
  - ✓ Use three-step method instead.
- ❑ Identification of engine leaks may require some use of solvents.
  - ✓ Minimize the use of solvents and use drip pans to collect spills and leaks.
- ❑ Prices for recycled materials and fluids may be higher than those of non-recycled materials.

# Vehicle and Equipment Repair SC-22

- Some facilities may be limited by a lack of providers of recycled materials, and by the absence of businesses to provide services such as hazardous waste removal, structural treatment practice maintenance, or solvent equipment and solvent recycling.

## Potential Facilities and Maintenance Requirements

### *Facilities Requirements*

- For facilities that already have covered areas where maintenance takes place, have berms or other means to retain spills and leaks, and/ have other appropriate constructed systems for containment, there may not need to be any significant new capital investment. Capital costs will likely be required at some sites if adequate cover and containment facilities do not exist and can vary significantly depending upon site conditions.



### *Maintenance Requirements*

- Most of the operations and maintenance activity associated with implementing this BMP are integrally linked to routine operations as previously described. Therefore, significant additional operations and maintenance efforts are not likely to be required.
- For facilities responsible for pre-treating their wastewater prior to discharging, the proper functioning of structural treatment system is an important maintenance consideration. Routine cleanout of oil and grease is required for the devices to maintain their effectiveness, usually at least once a month. During periods of heavy rainfall, cleanout is required more often to ensure pollutants are not washed through the trap. Sediment removal is also required on a regular basis to keep the device working efficiently.
- It is important to sweep the maintenance area weekly, if it is paved, to collect loose particles, and wipe up spills with rags and other absorbent material immediately. Do not hose down the area to a storm drain.

## Supplemental Information

### *Waste Reduction*

Parts are often cleaned using solvents such as trichloroethylene, 1,1,1-trichloroethane or methylene chloride. Many of these cleaners are harmful and must be disposed of as a hazardous waste. Cleaning without using liquid cleaners (e.g., wire brush) whenever possible reduces waste. Prevent spills and drips of solvents and cleansers to the shop floor. Do all liquid cleaning at a centralized station so the solvents and residues stay in one area. Locate drip pans, drain boards, and drying racks to direct drips back into a solvent sink or fluid holding tank for reuse. Reducing the number of solvents makes recycling easier and reduces hazardous waste management costs. Often, one solvent can perform a job as well as two different solvents.

- Clean parts without using liquid cleaners whenever possible to reduce waste.
- Prevent spills and drips of solvents and cleansers to the shop floor.

## Vehicle and Equipment Repair SC-22

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- ☐ Do all liquid cleaning at a centralized station so the solvents and residues stay in one area.
- ☐ Locate drip pans, drain boards, and drying racks to direct drips back into a solvent sink or fluid holding tank for reuse.

### ***Recycling***

Separating wastes allows for easier recycling and may reduce treatment costs. Keep hazardous and non-hazardous wastes separate, do not mix used oil and solvents, and keep chlorinated solvents (e.g., 1,1,1-trichloroethane) separate from non-chlorinated solvents (e.g., kerosene and mineral spirits).

Many products made of recycled (i.e., refined or purified) materials are available. Engine oil, transmission fluid, antifreeze, and hydraulic fluid are available in recycled form. Buying recycled products supports the market for recycled materials.

- ☐ Recycling is always preferable to disposal of unwanted materials.
- ☐ Separate wastes for easier recycling. Keep hazardous and non-hazardous wastes separate, do not mix used oil and solvents, and keep chlorinated solvents separate from non-chlorinated solvents.
- ☐ Label and track the recycling of waste material (e.g., used oil, spent solvents, batteries).
- ☐ Purchase recycled products to support the market for recycled materials.

### ***Safer Alternatives***

If possible, eliminate or reduce the amount of hazardous materials and waste by substituting non-hazardous or less hazardous material:

- ☐ Use non-caustic detergents instead of caustic cleaning for parts cleaning.
- ☐ Use detergent-based or water-based cleaning systems in place of organic solvent degreasers. Wash water may require treatment before it can be discharged to the sewer.
- ☐ Replace chlorinated organic solvents with non-chlorinated solvents. Non-chlorinated solvents like kerosene or mineral spirits are less toxic and less expensive to dispose of properly. Check list of active ingredients to see whether it contains chlorinated solvents.
- ☐ Choose cleaning agents that can be recycled.

### **References and Resources**

Orange County Stormwater Program, Best Management Practices for Industrial/Commercial Business Activities. Available online at: <http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessesactivities>.

## **Vehicle and Equipment Repair SC-22**

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Oregon Department of Environmental Quality, 2013. *Industrial Stormwater Best Management Practices Manual- BMP 8 Vehicle, Pavement and Building Washing*. Available online at: <http://www.deq.state.or.us/wq/wqpermit/docs/IndBMP021413.pdf>.

Sacramento Stormwater Management Program. *Best Management Practices for Industrial Storm Water Pollution Control*. Available online at: <http://www.msa.saccounty.net/sactostormwater/documents/guides/industrial-BMP-manual.pdf>.

Sacramento County Environmental Management Stormwater Program: Best Management Practices –Vehicle Washing. Available online at: <http://www.emd.saccounty.net/EnvHealth/Stormwater/Stormwater-BMPs.html>.

Santa Clara Valley Urban Runoff Pollution Prevention Program <http://www.scvurppp-w2k.com/>.

US EPA, National Pollutant Discharge Elimination System – Stormwater Menu of BMPs - Municipal Vehicle and Equipment Washing. Available online at: <http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=browse&Rbutton=detail&bmp=132>.

Washington State Department of Ecology, 2012. *Vehicle and Equipment Washwater Discharges Best Management Practices Manual*. Publication no. WQ-R-95-056. Available online at: <https://fortress.wa.gov/ecy/publications/publications/95056.pdf>.

# Outdoor Loading/Unloading SC-30

## Description

The loading/unloading of materials usually takes place outside on docks or terminals; therefore, materials spilled, leaked, or lost during loading/unloading may collect in the soil or on other surfaces and have the potential to be carried away by wind, stormwater runoff or when the area is cleaned. Additionally, rainfall may wash pollutants from machinery used to unload or move materials. Implementation of the following protocols will prevent or reduce the discharge of pollutants to stormwater from outdoor loading/unloading of materials.

## Approach

Reduce potential for pollutant discharge through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

## General Pollution Prevention Protocols

- ☐ Park tank trucks or delivery vehicles in designated areas so that spills or leaks can be contained.
- ☐ Limit exposure of material to rainfall whenever possible.
- ☐ Prevent stormwater run-on.
- ☐ Check equipment regularly for leaks.



## Good Housekeeping

- ☐ Develop an operations plan that describes procedures for loading and/or unloading.
- ☐ Conduct loading and unloading in dry weather if possible.

## Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

## Targeted Constituents

<i>Sediment</i>	✓
<i>Nutrients</i>	✓
<i>Trash</i>	
<i>Metals</i>	✓
<i>Bacteria</i>	
<i>Oil and Grease</i>	✓
<i>Organics</i>	✓

## Minimum BMPs Covered

	<i>Good Housekeeping</i>	✓
	<i>Preventative Maintenance</i>	
	<i>Spill and Leak Prevention and Response</i>	✓
	<i>Material Handling &amp; Waste Management</i>	✓
	<i>Erosion and Sediment Controls</i>	
	<i>Employee Training Program</i>	✓
	<i>Quality Assurance Record Keeping</i>	✓





# Outdoor Loading/Unloading SC-30

- ❑ Cover designated loading/unloading areas to reduce exposure of materials to rain.
- ❑ Consider placing a seal or door skirt between delivery vehicles and building to prevent exposure to rain.
- ❑ Design loading/unloading area to prevent stormwater run-on, which would include grading or berming the area, and position roof downspouts so they direct stormwater away from the loading/unloading areas.
- ❑ Have employees load and unload all materials and equipment in covered areas such as building overhangs at loading docks if feasible.
- ❑ Load/unload only at designated loading areas.
- ❑ Use drip pans underneath hose and pipe connections and other leak-prone spots during liquid transfer operations, and when making and breaking connections. Several drip pans should be stored in a covered location near the liquid transfer area so that they are always available, yet protected from precipitation when not in use. Drip pans can be made specifically for railroad tracks. Drip pans must be cleaned periodically, and drip collected materials must be disposed of properly.
- ❑ Pave loading areas with concrete instead of asphalt.
- ❑ Avoid placing storm drains inlets in the area.
- ❑ Grade and/or berm the loading/unloading area with drainage to sump; regularly remove materials accumulated in sump.



## ***Spill Response and Prevention Procedures***

- ❑ Keep your spill prevention and control plan up-to-date or have an emergency spill cleanup plan readily available, as applicable.
- ❑ Contain leaks during transfer.
- ❑ Store and maintain appropriate spill cleanup materials in a location that is readily accessible and known to all employees.
- ❑ Ensure that employees are familiar with the site's spill control plan and proper spill cleanup procedures.
- ❑ Use drip pans or comparable devices when transferring oils, solvents, and paints.



## ***Material Handling and Waste Management***

- ❑ Spot clean leaks and drips routinely to prevent runoff of spillage.
- ❑ Do not pour liquid wastes into floor drains, sinks, outdoor storm drain inlets, or other storm drains or sewer connections.



# Outdoor Loading/Unloading SC-30

- ☐ Do not put used or leftover cleaning solutions, solvents, and automotive fluids in the storm drain or sanitary sewer.
- ☐ Collect leaking or dripping fluids in drip pans or containers. Fluids are easier to recycle if kept separate.
- ☐ Promptly transfer used fluids to the proper waste or recycling drums. Do not leave drip pans or other open containers lying around.
- ☐ Minimize the possibility of stormwater pollution from outside waste receptacles by doing at least one of the following:
  - ✓ Use only watertight waste receptacle(s) and keep the lid(s) closed.
  - ✓ Grade and pave the waste receptacle area to prevent run-on of stormwater.
  - ✓ Install a roof over the waste receptacle area.
  - ✓ Install a low containment berm around the waste receptacle area.
  - ✓ Use and maintain drip pans under waste receptacles.
- ☐ Post “no littering” signs.
- ☐ Perform work area clean-up and dry sweep after daily operations.



## ***Employee Training Program***

- ☐ Train employees (e.g., fork lift operators) and contractors on proper spill containment and cleanup.
- ☐ Have employees trained in spill containment and cleanup present during loading/unloading.
- ☐ Train employees in proper handling techniques during liquid transfers to avoid spills.
- ☐ Make sure forklift operators are properly trained on loading and unloading procedures.



## ***Quality Assurance and Record Keeping***

- ☐ Keep accurate maintenance logs that document activities performed, quantities of materials removed, and improvement actions.
- ☐ Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.
- ☐ Establish procedures to complete logs and file them in the central office.
- ☐ Keep accurate logs of daily clean-up operations.

# Outdoor Loading/Unloading SC-30

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## Potential Limitations and Work-Arounds

Some facilities may have space constraints, limited staffing and time limitations that may preclude implementation of BMPs. Provided below are typical limitations and recommended “work-arounds.”

- ❑ Space and time limitations may preclude all transfers from being performed indoors or under cover.
  - ✓ Designate specific areas for outdoor loading and unloading.
  - ✓ Require employees to understand and follow spill and leak prevention BMPs.
- ❑ It may not be possible to conduct transfers only during dry weather.
  - ✓ Limit materials and equipment rainfall exposure to all extents practicable.
  - ✓ Require employees to understand and follow spill and leak prevention BMPs.

## Potential Capital Facility Costs and Operation & Maintenance Requirements

### *Facilities*

Many facilities will already have indoor or covered areas where loading/unloading takes place and will require no additional capital expenditures.

If outdoor activities are required, construction of berms or other means to retain spills and leaks may require appropriate constructed systems for containment. These containment areas may require significant new capital investment.

Capital investments will likely be required at some sites if adequate cover and containment facilities do not exist and can vary significantly depending upon site conditions.

### *Maintenance*

Most of the operations and maintenance activities associated with implementing this BMP are integrally linked to routine operations as previously described. Therefore additional O&M is not required.

- ❑ Conduct regular inspections and make repairs and improvements as necessary.
- ❑ Check loading and unloading equipment regularly for leaks.
- ❑ Conduct regular broom dry-sweeping of area. Do not wash with water.

## Supplemental Information

### *Loading and Unloading of Liquids*

- ❑ Loading or unloading of liquids should occur in the manufacturing building so that any spills that are not completely retained can be discharged to the sanitary sewer,

# Outdoor Loading/Unloading SC-30

treatment plant, or treated in a manner consistent with local sewer authorities and permit requirements.

- For loading and unloading tank trucks to above and below ground storage tanks, the following procedures should be used:
  - ✓ The area where the transfer takes place should be paved. If the liquid is reactive with the asphalt, Portland cement should be used to pave the area.
  - ✓ The transfer area should be designed to prevent run-on of stormwater from adjacent areas. Sloping the pad and using a curb, like a speed bump, around the uphill side of the transfer area should reduce run-on.
  - ✓ The transfer area should be designed to prevent runoff of spilled liquids from the area. Sloping the area to a drain should prevent runoff. The drain should be connected to a dead-end sump or to the sanitary sewer. A positive control valve should be installed on the drain.
- For transfer from rail cars to storage tanks that must occur outside, use the following procedures:
  - ✓ Drip pans should be placed at locations where spillage may occur, such as hose connections, hose reels, and filler nozzles. Use drip pans when making and breaking connections.
  - ✓ Drip pan systems should be installed between the rails to collect spillage from tank cars.

## References and Resources

Minnesota Pollution Control Agency, *Industrial Stormwater Best Management Practices Guidebook BMP 26 Fueling and Liquid Loading/Unloading Operations*. Available online at: <http://www.pca.state.mn.us/index.php/view-document.html?gid=10557>.

New Jersey Department of Environmental Protection, 2013. *Basic Industrial Stormwater General Permit Guidance Document NJPDES General Permit No NJ0088315*. Available online at: [http://www.nj.gov/dep/dwq/pdf/5G2\\_guidance\\_color.pdf](http://www.nj.gov/dep/dwq/pdf/5G2_guidance_color.pdf).

Orange County Stormwater Program, Best Management Practices for Industrial/Commercial Business Activities. Available online at: <http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessactivities>.

Oregon Department of Environmental Quality, 2013. *Industrial Stormwater Best Management Practices Manual- BMP 26 Fueling and Liquid Loading/Unloading Operations*. Available online at: <http://www.deq.state.or.us/wq/wqpermit/docs/IndBMP021413.pdf>.

## **Outdoor Loading/Unloading SC-30**

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Sacramento Stormwater Management Program, *Best Management Practices for Industrial Storm Water Pollution Control*. Available online at:  
<http://www.msa.saccounty.net/sactostormwater/documents/guides/industrial-BMP-manual.pdf>.

Sacramento County Environmental Management Stormwater Program: *Best Management Practices*. Available online at:  
<http://www.emd.saccounty.net/EnvHealth/Stormwater/Stormwater-BMPs.html>.

Santa Clara Valley Urban Runoff Pollution Prevention Program. <http://www.scvurppp-w2k.com/>.

US EPA. National Pollutant Discharge Elimination System – Industrial Fact Sheet Series for Activities Covered by EPA's Multi Sector General Permit. Available online at:  
<http://cfpub.epa.gov/npdes/stormwater/swsectors.cfm>.

# Outdoor Liquid Container Storage SC-31

## Description

Accidental releases of materials from above ground liquid storage tanks, drums, and dumpsters present the potential for contaminating stormwater with many different pollutants. Tanks may store many potential stormwater runoff pollutants, such as gasoline, aviation gas, diesel fuel, kerosene, oils, greases, lubricants and other distilled, blended and refined products derived from crude petroleum. Materials spilled, leaked, or lost from storage tanks may accumulate in soils or on other surfaces and be carried away by rainfall runoff. These source controls apply to containers located outside of a building used to temporarily store liquid materials and include installing safeguards against accidental releases, installing secondary containment, conducting regular inspections, and training employees in standard operating procedures and spill cleanup techniques.

## Approach

### General Pollution Prevention Protocols

- ☐ Educate employees about pollution prevention measures and goals.
- ☐ Keep an accurate, up-to-date inventory of the materials delivered and stored on-site.
- ☐ Try to keep chemicals in their original containers, and keep them well labeled.
- ☐ Develop an operations plan that describes procedures for loading and/or unloading. Refer to SC-30 Outdoor Loading/Unloading of Materials for more detailed BMP information pertaining to loading and unloading of liquids.
- ☐ Protect materials from rainfall, run-on, runoff, and wind dispersal:
  - ✓ Cover the storage area with a roof.

## Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize

## Targeted Constituents

<i>Sediment</i>	
<i>Nutrients</i>	✓
<i>Trash</i>	
<i>Metals</i>	✓
<i>Bacteria</i>	
<i>Oil and Grease</i>	✓
<i>Organics</i>	✓

## Minimum BMPs Covered

	<i>Good Housekeeping</i>	
	<i>Preventative Maintenance</i>	✓
	<i>Spill and Leak Prevention and Response</i>	✓
	<i>Material Handling &amp; Waste Management</i>	✓
	<i>Erosion and Sediment Controls</i>	
	<i>Employee Training Program</i>	✓
	<i>Quality Assurance Record Keeping</i>	✓





## Outdoor Liquid Container Storage **SC-31**

- ✓ Minimize stormwater run-on by enclosing the area or building a berm around it.
- ✓ Use a walled structure for storage of liquid containers.
- ✓ Use only watertight containers and keep the lids closed.
- Employ safeguards against accidental releases:
  - ✓ Provide overflow protection devices to warn operator or automatic shutdown transfer pumps.
  - ✓ Provide protection guards (bollards) around tanks and piping to prevent damage from a vehicle or forklift.
  - ✓ Provide clear tagging or labeling, and restrict access to valves to reduce human error.
  - ✓ Berm or surround tank or container with secondary containment system, including dikes, liners, vaults, or double walled tanks.
  - ✓ Be aware and ready to address the fact that some municipalities require secondary containment areas to be connected to the sanitary sewer, prohibiting any hard connections to the storm drain.
  - ✓ Contact the appropriate regulatory agency regarding environmental compliance for facilities with “spill ponds” designed to intercept, treat, and/or divert spills.
  - ✓ Have registered and specifically trained professional engineers identify and correct potential problems such as loose fittings, poor welding, and improper or poorly fitted gaskets for newly installed tank systems.
- Use MSDSs to ID hazardous components and keep incompatible products apart and to list/have available appropriate PPE and clean-up products.



### **Good Housekeeping**

- Provide storage tank piping located below product level with a shut-off valve at the tank; ideally this valve should be an automatic shear valve with the shut-off located inside the tank.
- Provide barriers such as posts or guardrails, where tanks are exposed, to prevent collision damage with vehicles.
- Provide secure storage to prevent vandalism-caused contamination.
- Place tight-fitting lids on containers.



## Outdoor Liquid Container Storage **SC-31**

- ☐ Enclose or cover the containers where they are stored.
- ☐ Raise the containers off the ground by use of pallet or similar method, with provisions for spill control.
- ☐ Do not store liquid containers near the storm drainage system or surface waters.
- ☐ Sweep and clean the storage area regularly if it is paved, do not hose down the area to a storm drain.



### ***Preventative Maintenance***

- ☐ Inspect storage areas regularly for leaks or spills.
- ☐ Conduct routine inspections and check for external corrosion of material containers. Also check for structural failure, spills and overfills due to operator error, failure of piping system.
- ☐ Check for leaks or spills during pumping of liquids or gases from truck or rail car to a storage facility or vice versa.
- ☐ Visually inspect new tank or container installations for loose fittings, poor welding, and improper or poorly fitted gaskets.
- ☐ Inspect tank foundations, connections, coatings, and tank walls and piping system. Look for corrosion, leaks, cracks, scratches, and other physical damage that may weaken the tank or container system.
- ☐ Replace containers that are leaking, corroded, or otherwise deteriorating with ones in good condition. If the liquid chemicals are corrosive, containers made of compatible materials must be used instead of metal drums.
- ☐ New or secondary containers must be labeled with the product name and hazards.



### ***Spill Response and Prevention Procedures***

- ☐ Keep your spill prevention and control plan up-to-date.
- ☐ Maintain an adequate stockpile of spill cleanup materials at locations where it will be readily accessible.
- ☐ Have an emergency plan, equipment, and trained personnel ready at all times to deal immediately with major spills.
- ☐ Collect spilled liquids and properly dispose of them.
- ☐ Remove the adsorbent materials promptly and dispose of properly when using adsorbent materials on small spills.
- ☐ Have employees trained in emergency spill cleanup procedures present when dangerous waste, liquid chemicals, or other wastes are delivered.

## Outdoor Liquid Container Storage **SC-31**

- ❑ Prevent operator errors by using engineering safeguards and thus reducing accidental releases of pollutants.



### ***Material Handling and Waste Management***

- ❑ Contain the material in such a manner that if the container leaks or spills, the contents will not discharge, flow, or be washed into the storm drainage system, surface waters or groundwater.
- ❑ Place drip pans or absorbent materials beneath mounted container taps, and at potential drip and spill locations during filling and unloading of containers. Any collected liquids or soiled absorbent materials must be reused/recycled or properly disposed.
- ❑ Ensure that any underground or aboveground storage tanks are designed and managed in accordance with applicable regulations, identified as a potential pollution source, and have secondary containment such as a berm or dike with an impervious surface.
- ❑ Do not pour liquids into floor drains, sinks, outdoor storm drain inlets, or other storm drains or sewer connections.
- ❑ Collect leaking or dripping fluids in drip pans or containers. Fluids are easier to recycle if kept separate.
- ❑ Promptly transfer used fluids to the proper waste or recycling drums. Do not leave drip pans or other open containers lying around.



### ***Employee Training Program***

- ❑ Train employee (e.g., fork lift operators) and contractors in proper spill containment and cleanup. The employee should have the tools and knowledge to immediately begin cleaning up a spill if one should occur.
- ❑ Train employees in proper spill response and prevention, materials handling, and waste management.
- ❑ Use a training log or similar method to document training.



### ***Quality Assurance and Record Keeping***

- ❑ Keep accurate maintenance/inspection logs that document minimum BMP activities performed for liquid container storage and improvement actions.
- ❑ Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.
- ❑ Establish procedures to complete logs and file them in the central office.

### **Other Facility-Specific Considerations**

- ❑ Storage sheds often must meet building and fire code requirements.

## Outdoor Liquid Container Storage SC-31

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- ❑ The local fire district must be consulted for limitations on clearance of roof covers over containers used to store flammable materials.
- ❑ All specific standards set by Federal and State laws concerning the storage of oil and hazardous materials must be met.
- ❑ Storage of reactive, ignitable, or flammable liquids should comply with the Uniform Fire Code and the National Electric Code.
- ❑ Storage of oil and hazardous materials must meet specific Federal and State standards including:
  - ✓ Spill Prevention Control and Countermeasure Plan (SPCC) Plan;
  - ✓ Secondary containment;
  - ✓ Integrity and leak detection monitoring; and
  - ✓ Emergency preparedness plans.

### Potential Capital Facility Costs and Operation & Maintenance Requirements

#### *Facilities*

- ❑ Capital investments such as sheds, covers, dikes, and curbs will likely be required at some sites if adequate cover and containment facilities do not exist and can vary significantly depending upon site conditions.

#### *Maintenance*

- ❑ Most of the operations and maintenance activities associated with implementing this BMP are integrally linked to routine operations as previously described. Therefore additional O&M is not required.
- ❑ Conduct regular inspections and make repairs and improvements as necessary.
- ❑ Conduct regular broom dry-sweeping of area. Do not wash with water.

### Supplemental Information

The most common causes of unintentional releases are:

- ❑ Installation problems;
- ❑ Failure of piping systems (pipes, pumps, flanges, couplings, hoses, and valves);
- ❑ External corrosion and structural failure;
- ❑ Spills and overfills due to operator error; and
- ❑ Leaks during pumping of liquids or gases from truck or rail car to a storage tank or vice versa.

## Outdoor Liquid Container Storage **SC-31**

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### ***Aboveground Tank Leak and Spill Control***

Storage of reactive, ignitable, or flammable liquids should comply with the Uniform Fire Code and the National Electric Code. Practices listed below should be employed to enhance the code requirements:

- ❑ Tanks should be placed in a designated area.
- ❑ Tanks located in areas where firearms are discharged should be encapsulated in concrete or the equivalent.
- ❑ Designated areas should be paved with Portland cement concrete, free of cracks and gaps, and impervious in order to contain leaks and spills.
- ❑ Liquid materials should be stored in UL approved double walled tanks or surrounded by a curb or dike to provide the volume to contain 10% of the volume of the containers or 110% of the volume of the largest container, whichever is greater. The area inside the curb should slope to a drain.
- ❑ For used oil or dangerous waste, a dead-end sump should be installed in the drain.
- ❑ Other liquids should be drained to the sanitary sewer if available. The drain must have a positive control such as a lock, valve, or plug to prevent release of contaminated liquids.
- ❑ Accumulated stormwater in petroleum storage areas should be passed through an oil/water separator.

Maintenance is critical to preventing leaks and spills. Conduct routine weekly inspections and:

- ❑ Check for external corrosion and structural failure.
- ❑ Check for spills and overfills due to operator error.
- ❑ Check for failure of piping system (pipes, pumps, flanger, coupling, hoses, and valves).
- ❑ Check for leaks or spills during pumping of liquids or gases from truck or rail car to a storage facility or vice versa.
- ❑ Inspect new tank or container installation visually for loose fittings, poor welding, and improper or poorly fitted gaskets.
- ❑ Inspect tank foundations, connections, coatings, and tank walls and piping system. Look for corrosion, leaks, cracks, scratches, and other physical damage that may weaken the tank or container system.
- ❑ Frequently release accumulated stormwater during the wet season.
- ❑ Have periodic integrity testing conducted by a qualified professional.

## Outdoor Liquid Container Storage SC-31

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### ***Dikes***

One of the best protective measures against contamination of stormwater is the use of dikes. Containment dikes are berms or retaining walls that are designed to hold spills. Use of dikes is an effective pollution prevention measure for above ground storage tanks and railcar or tank truck loading and unloading areas. The dike surrounds the area of concern and holds the spill, keeping spill materials separated from the stormwater side of the dike area. Diking can be used in any industrial or municipal facility, but it is most commonly used for controlling large spills or releases from liquid storage areas and liquid transfer areas.

- ❑ For single-wall tanks, containment dikes should be large enough to hold the contents of the storage tank for the facility plus rain water.
- ❑ For trucks, diked areas should be capable of holding an amount equal to the volume of the tank truck compartment. Diked construction material should be strong enough to safely hold spilled materials.
- ❑ Dike materials can consist of earth, concrete, synthetic materials, metal, or other impervious materials.
- ❑ Strong acids or bases may react with metal containers, concrete, and some plastics.
- ❑ Where strong acids or bases are stored, alternative dike materials should be considered. More active organic chemicals may need certain special liners for dikes.
- ❑ Dikes may also be designed with impermeable materials to increase containment capabilities.
- ❑ Dikes should be inspected during or after significant storms or spills to check for washouts or overflows.
- ❑ Regular checks of containment dikes to insure the dikes are capable of holding spills should be conducted.
- ❑ Inability of a structure to retain stormwater, dike erosion, soggy areas, or changes in vegetation indicate problems with dike structures. Damaged areas should be patched and stabilized immediately.
- ❑ Earthen dikes may require special maintenance of vegetation such as mulching and irrigation.
- ❑ Remove accumulated stormwater after precipitation events and dispose of according to local regulations.

### ***Curbing***

Curbing is a barrier that surrounds an area of concern. Curbing is similar to containment diking in the way that it prevents spills and leaks from being released into the environment. Curbing is usually small scaled and does not contain large spills to the degree that dikes can. Curbing is common at many facilities in small areas where

## Outdoor Liquid Container Storage SC-31

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handling and transfer of liquid materials occur. Curbing can redirect contaminated stormwater away from the storage area. It is useful in areas where liquid materials are transferred from one container to another. Asphalt is a common material used for curbing; however, curbing materials can include earth, concrete, synthetic materials, metal, or other impenetrable materials.

- ❑ Spilled materials should be removed immediately from curbed areas to allow space for future spills.
- ❑ Curbs should have manually-controlled pump systems rather than common drainage systems for collection of spilled materials.
- ❑ The curbed area should be inspected regularly to clear clogging debris.
- ❑ Maintenance should also be conducted frequently to prevent overflow of any spilled materials as curbed areas are designed only for smaller spills.
- ❑ Remove accumulated stormwater after precipitation events and dispose of according to local regulations.
- ❑ Curbing has the following advantages:
  - ✓ Excellent run-on control;
  - ✓ Inexpensive;
  - ✓ Ease of installment;
  - ✓ Provides option to recycle materials spilled in curb areas; and
  - ✓ Common industry practice.

### References and Resources

Clark County Clean Water Program. 2009. *Clark County Stormwater Pollution Control Manual Best Management Practices for Businesses and Government Agencies, AS A2 & A3*. Available online at:  
<http://www.clark.wa.gov/boards/CleanWater/documents/PollutionControlManual.pdf>.

King County Storm Water Pollution Prevention Manual, 2009 *Commercial Best Management Practice (BMP) Activity Sheets: A-2 Storage of Liquid Materials in Stationary Tanks and A-3 Storage of Liquid Materials in Portable Containers*. Available online at:  
<http://www.kingcounty.gov/environment/waterandland/stormwater/documents/pollution-prevention-manual/commercial-bmp.aspx>.

Orange County Stormwater Program, Best Management Practices for Industrial/Commercial Business Activities. Available online at:  
<http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessesactivities>.



## **Outdoor Liquid Container Storage SC-31**

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US EPA. National Pollutant Discharge Elimination System (NPDES) *Industrial Fact Sheet Series for Activities Covered by EPA's MSGP*. Available online at: <http://cfpub.epa.gov/npdes/stormwater/swsectors.cfm>.

# Outdoor Equipment Operations SC-32

## Description

Outside process equipment operations and maintenance can contaminate stormwater runoff. Activities, such as grinding, painting, coating, sanding, degreasing or parts cleaning, landfills and waste piles, and solid waste treatment and disposal are examples of process operations that can lead to contamination of stormwater runoff. The targeted constituents will vary for each site depending on the operation being performed.

## Approach

Implement source control BMPs to limit exposure of outdoor equipment to direct precipitation and stormwater run-on. Refer to SC-22 Vehicle and Equipment Repair for additional information.

## General Pollution Prevention Protocols

- ☐ Perform the activity during dry periods whenever possible.
- ☐ Install secondary containment measures where leaks and spills may occur.
- ☐ Use non-toxic chemicals for maintenance and minimize or eliminate the use of solvents.
- ☐ Connect process equipment area to public sanitary sewer or facility wastewater treatment system when possible. Some jurisdictions require that secondary containment areas be connected to the sanitary sewer, prohibiting any hard connections to the storm drain.



## Good Housekeeping

- ☐ Manage materials and waste properly (see Material Handling and Waste Management) to reduce adverse impacts on stormwater quality.

## Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize

## Targeted Constituents

<i>Sediment</i>	✓
<i>Nutrients</i>	✓
<i>Trash</i>	✓
<i>Metals</i>	✓
<i>Bacteria</i>	✓
<i>Oil and Grease</i>	✓
<i>Organics</i>	✓

## Minimum BMPs Covered

	<i>Good Housekeeping</i>	✓
	<i>Preventative Maintenance</i>	✓
	<i>Spill and Leak Prevention and Response</i>	✓
	<i>Material Handling &amp; Waste Management</i>	✓
	<i>Erosion and Sediment Controls</i>	
	<i>Employee Training Program</i>	✓
	<i>Quality Assurance Record Keeping</i>	✓



# Outdoor Equipment Operations SC-32

- ❑ Cover the work area with a permanent roof if possible.
- ❑ Use drop cloths for sanding and painting operations.
- ❑ Use a vacuum for fine particle clean-up in pavement cracks and crevices.
- ❑ Minimize contact of stormwater with outside process equipment operations through berming and drainage routing (run-on prevention).
- ❑ "Spot clean" leaks and drips routinely. Leaks are not cleaned up until the absorbent is picked up and disposed of properly.
- ❑ Paint signs on storm drain inlets to indicate that they are not to receive liquid or solid wastes.
- ❑ Use roll down or permanent walls when windy/breezy to prevent wind transport of particulates/pollutants.



## ***Preventative Maintenance***

- ❑ Design outdoor equipment areas to prevent stormwater runoff and spills. Use a perimeter drain or slope pavement inward with drainage to sump.
- ❑ Dry clean the work area regularly. Do not wash outdoor equipment with water if there is a direct connection to the storm drain.
- ❑ Pave area with concrete rather than asphalt.
- ❑ Inspect outdoor equipment regularly for leaks or spills. Also check for structural failure, spills and overfills due to operator error, and/or failure of piping system.
- ❑ Inspect and clean, if necessary, storm drain inlets and catch basins within the outdoor equipment area before October 1 each year.



## ***Spill Response and Prevention Procedures***

- ❑ Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- ❑ Have employees trained in emergency spill cleanup procedures present when dangerous waste, liquid chemicals, or other wastes are delivered.
- ❑ Place a stockpile of spill cleanup materials where it will be readily accessible.
- ❑ Prevent operator errors by using engineering safe guards and thus reducing accidental releases of pollutant.



## ***Material Handling and Waste Management***

## Outdoor Equipment Operations SC-32

- ☐ Do not pour liquid wastes into floor drains, sinks, outdoor storm drain inlets, or other storm drain or sewer connections.
- ☐ Collect leaking or dripping fluids in drip pans or containers. Fluids are easier to recycle if kept separate.
- ☐ Promptly transfer used fluids to the proper waste or recycling drums. Do not leave drip pans or other open containers lying around.
- ☐ Minimize the possibility of stormwater pollution from outside waste receptacles by doing at least one of the following:
  - ✓ Use only watertight waste receptacle(s) and keep the lid(s) closed.
  - ✓ Grade and pave the waste receptacle area to prevent run-on of stormwater.
  - ✓ Install a roof over the waste receptacle area.



### ***Employee Training Program***

- ☐ Educate employees about pollution prevention measures and goals.
- ☐ Train employees on proper equipment operation and maintenance procedures.
- ☐ Train all employees upon hiring and annually thereafter on proper methods for handling and disposing of waste. Ensure that all employees understand stormwater discharge prohibitions, wastewater discharge requirements, and these best management practices.
- ☐ Use a training log or similar method to document training.
- ☐ Ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.



### ***Quality Assurance and Record Keeping***

- ☐ Keep accurate maintenance logs that document minimum BMP activities performed for outdoor equipment, types and quantities of materials removed and disposed of, and any improvement actions.
- ☐ Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.
- ☐ Establish procedures to complete logs and file them in the central office.

### **Potential Limitations and Work-Arounds**

Some facilities may have space constraints, limited staffing and time limitations that may preclude implementation of BMPs. Provided below are typical limitations and recommended "work-arounds."

## **Outdoor Equipment Operations SC-32**

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- ❑ Providing cover over outdoor equipment may be impractical or cost-prohibitive.
  - ✓ Operate outdoor equipment only during periods of dry weather.
- ❑ Regular operations and time limitations may require outdoor activities during wet weather.
  - ✓ Designate specific areas for outdoor activities.
  - ✓ Allow time for work area clean-up after each shift.
  - ✓ Require employees to understand and follow preventive maintenance and spill and leak prevention BMPs.
  - ✓ Design and install secondary containment and good housekeeping BMPs for outdoor equipment area.
- ❑ Storage sheds often must meet building and fire code requirements.

### **Potential Capital Facility Costs and Operation & Maintenance Requirements**

#### ***Facilities***

- ❑ Many facilities will already have indoor covered areas where vehicle and equipment repairs take place and will require no additional capital expenditures.
- ❑ If outdoor activities are required, construction of berms or other means to retain spills and leaks may require appropriate constructed systems for containment. These containment areas may require significant new capital investment.
- ❑ Capital investments will likely be required at some sites if adequate cover and containment facilities do not exist and can vary significantly depending upon site conditions.

#### ***Maintenance***

- ❑ Most of the operations and maintenance activities associated with implementing this BMP are integrally linked to routine operations as previously described. Therefore additional O&M is not required.
- ❑ For facilities responsible for pre-treating their wastewater prior to discharging, the proper functioning of structural treatment system is an important maintenance consideration.
- ❑ Routine cleanout of oil and grease is required for the devices to maintain their effectiveness, usually at least once a month. During periods of heavy rainfall, cleanout is required more often to ensure pollutants are not washed through the trap. Sediment removal is also required on a regular basis to keep the device working efficiently.

# **Outdoor Equipment Operations SC-32**

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## **References and Resources**

Minnesota Pollution Control Agency. *Industrial Stormwater Best Management Practices Guidebook BMP 26 Fueling and Liquid Loading/Unloading Operations*. Available online at: <http://www.pca.state.mn.us/index.php/view-document.html?gid=10557>.

New Jersey Department of Environmental Protection, 2013. *Basic Industrial Stormwater General Permit Guidance Document NJPDES General Permit No NJ0088315*. Available online at: [http://www.nj.gov/dep/dwg/pdf/5G2\\_guidance\\_color.pdf](http://www.nj.gov/dep/dwg/pdf/5G2_guidance_color.pdf).

Orange County Stormwater Program, Best Management Practices for Industrial/Commercial Business Activities. Available online at: <http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessesactivities>.

Oregon Department of Environmental Quality, *Industrial Stormwater Best Management Practices Manual- BMP 26 Fueling and Liquid Loading/Unloading Operations*, February 2013. Available online at: <http://www.deq.state.or.us/wq/wqpermit/docs/IndBMP021413.pdf>.

Sacramento Stormwater Management Program. *Best Management Practices for Industrial Storm Water Pollution Control*. Available online at: <http://www.msa.saccounty.net/sactostormwater/documents/guides/industrial-BMP-manual.pdf>.

Sacramento County Environmental Management Stormwater Program: Best Management Practices. Available online at: <http://www.emd.saccounty.net/EnvHealth/Stormwater/Stormwater-BMPs.html>.

Santa Clara Valley Urban Runoff Pollution Prevention Program. <http://www.scvurppp-w2k.com/>

US EPA. National Pollutant Discharge Elimination System – Industrial Fact Sheet Series for Activities Covered by EPA’s Multi Sector General Permit. Available online at: <http://cfpub.epa.gov/npdes/stormwater/swsectors.cfm>.



# Outdoor Storage of Raw Materials SC-33

## Description

Stockpiles of raw materials, by-products, and finished products exposed to rain and/or runoff can pollute stormwater. Stormwater can become contaminated when materials wash off or dissolve into water due to improper storage and containment. To prevent or reduce the discharge of pollutants to stormwater from raw material delivery and storage, pollution prevention and source control measures must be implemented, such as minimizing the storage of hazardous materials on-site, enclosing or covering materials, storing materials in a designated area, installing secondary containment, conducting regular inspections, preventing stormwater run-on and runoff, and training employees and subcontractors. This fact sheet focuses on source control BMPs for stockpiles of solid materials; if the raw material, by-product, or product is a liquid, more information for outside storage of liquids can be found under SC-31 Outdoor Liquid Container Storage.

## Approach

Reduce potential for pollutant discharge through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

## General Pollution Prevention Protocols

- ☐ Emphasize employee education for successful BMP implementation.
- ☐ Store materials that could contaminate stormwater inside or under permanent cover. If this is not feasible, then all outside storage areas should be covered with a roof and bermed or enclosed to prevent stormwater contact.
- ☐ Elevate and tarp solid materials such as beams, metal, etc.
- ☐ Minimize the inventory of raw materials kept outside.

## Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize

## Targeted Constituents

Sediment	✓
Nutrients	✓
Trash	
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

## Minimum BMPs Covered

 Good Housekeeping	✓
 Preventative Maintenance	✓
 Spill and Leak Prevention and Response	✓
 Material Handling & Waste Management	
 Erosion and Sediment Controls	✓
 Employee Training Program	✓
 Quality Assurance Record Keeping	✓



## Outdoor Storage of Raw Materials SC-33

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- ❑ Keep an accurate, up-to-date inventory of the materials delivered and stored on-site.
- ❑ Stormwater runoff that could potentially be contaminated by materials stored outdoors should be drained to the sanitary sewer if available. The drain must have a positive control such as a lock, valve, or plug to prevent release of contaminated liquids.



### ***Good Housekeeping***

- ❑ If raw materials cannot all be stored inside or under permanent cover, prevent exposure to direct precipitation and stormwater run-on by installing a storm-resistant waterproof covering made of polyethylene, polypropylene or hypalon over all materials stored outside. The covers must be in place at all times when work with the stockpiles is not occurring (Applicable to small stockpiles only).
- ❑ Implement erosion control practices at the perimeter of the facility site and at any catch basins to prevent erosion of the stockpiled material off-site, if the stockpiles are so large that they cannot feasibly be covered and contained.
- ❑ Minimize stormwater run-on by enclosing the area or building a berm around it.
- ❑ Keep storage areas clean and dry.
- ❑ Slope paved areas in a manner that minimizes pooling of water on the site, particularly with materials that may leach pollutants into stormwater and/or groundwater, such as compost, logs, and wood chips. A minimum slope of 1.5% is recommended.
- ❑ Secure drums stored in an area where unauthorized persons may not gain access to prevent accidental spillage, pilferage, or any unauthorized use.
- ❑ Install curbing or berms along the perimeter of the area to prevent the run-on of uncontaminated stormwater from adjacent areas as well as runoff of stormwater from the stockpile areas.
- ❑ Slope the area inside the curb or berm to a drain with sump. The sump should be equipped with an oil and water separator if applicable for materials stored onsite.
- ❑ Do not store materials on top of or directly adjacent to storm drain inlets.
- ❑ Cover wood products treated with chromated copper arsenate, ammoniacal copper zinc arsenate, creosote, or pentachlorophenol with properly secured tarps or store indoors.



### ***Preventative Maintenance***

- ❑ Maintain outdoor storage containers in good condition. Replace leaky or otherwise inadequate containers as necessary.
- ❑ Maintain outdoor waterproof covers (e.g., tarps) in good condition and properly secure them to be storm resistant. Replace tarps damaged by UV exposure or wear and tear on a regular basis.

# Outdoor Storage of Raw Materials SC-33

- ☐ Perform routine inspection of storm drains and sumps and regularly remove accumulated materials.
- ☐ Dry clean the work area regularly. Do not wash outdoor material storage areas with water if there is a direct connection to the storm drain.
- ☐ Pave outdoor storage areas for liquids such as solvents with concrete rather than asphalt.
- ☐ Conduct regular inspections of storage areas so that leaks and spills are detected as soon as possible.
- ☐ Routinely inspect berms, curbing, containment, and sediment controls for proper function and repair as necessary.



## ***Spill and Leak Prevention and Response***

- ☐ Keep the facility spill prevention and control plan up-to-date.
- ☐ Place a stockpile of spill cleanup materials, such as brooms, dustpans, and vacuum sweepers (if desired) near the storage area where it will be readily accessible.
- ☐ Have employees trained in spill containment and cleanup present during the loading/unloading of hazardous or otherwise dangerous materials.



## ***Erosion and Sediment Controls***

- ☐ Keep materials covered to prevent erosion of stockpiles. This may not be feasible for large stockpiles.
- ☐ Install sediment controls such as fiber rolls around the perimeter of stockpiles to prevent transport of raw materials to the storm drain.
- ☐ Install drain inlet protection around all inlets to prevent raw materials from entering storm drain.
- ☐ Install sediment controls such as silt fence around the perimeter of the site to prevent transport of raw materials to the storm drain or offsite surface waters.



## ***Employee Training Program***

- ☐ Educate employees about pollution prevention measures and goals.
- ☐ Train employees how to properly store outdoor raw materials using the source control BMPs described above.
- ☐ Use a training log or similar method to document training.
- ☐ Ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.

# Outdoor Storage of Raw Materials SC-33



## **Quality Assurance and Record Keeping**

- ☐ Keep accurate maintenance logs that document minimum BMP activities performed for outdoor storage of raw materials, types and quantities of materials removed and disposed of, and any improvement actions.
- ☐ Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.
- ☐ Establish procedures to complete logs and file them in the central office.

## **Other Facility-Specific Considerations**

- ☐ Storage sheds often must meet building and fire code requirements. Storage of reactive, ignitable, or flammable liquids must comply with the Uniform Fire Code and the National Electric Code.
- ☐ Some municipalities require that secondary containment areas (regardless of size) be connected to the sanitary sewer, prohibiting any hard connections to the storm drain.
- ☐ The local fire district must be consulted for limitations on clearance of roof covers over containers used to store flammable materials.

## **Potential Limitations and Work-Arounds**

Some facilities may have space constraints, limited staffing and time limitations that may preclude implementation of BMPs. Provided below are typical limitations and recommended “work-arounds”

- ☐ Space limitations may preclude storing all materials indoors.
  - ✓ Implement good housekeeping, preventative maintenance, and erosion and sediment controls as described above.

## **Potential Capital Facility Costs and Operation & Maintenance Requirements**

### ***Facilities***

- ☐ Many facilities will already have indoor covered areas where raw materials will be stored and will require no additional capital expenditures.
- ☐ If outdoor storage of materials is required, construction of berms or other means to prevent stormwater run-on and runoff may require appropriate constructed systems for containment. These containment areas may require significant new capital investment.
- ☐ Purchase and installation of erosion and sediment controls will require additional capital investments, and this amount will vary depending on site characteristics.
- ☐ Capital investments will likely be required at some sites if adequate cover and containment facilities do not exist and can vary significantly depending upon site conditions.



# Outdoor Storage of Raw Materials SC-33

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## ***Maintenance***

- ❑ Accurate and up-to-date inventories should be kept of all stored materials.
- ❑ Berms and curbs may require periodic repair and patching.
- ❑ Parking lots or other surfaces near bulk materials storage areas should be swept periodically to remove debris blown or washed from storage areas.
- ❑ Sweep paved storage areas regularly for collection and disposal of loose solid materials, do not hose down the area to a storm drain or conveyance ditch.
- ❑ Erosion and sediment controls require regular inspection and periodic replacement or reinstallation.

## **Supplemental Information**

### ***Raw Material Containment***

Paved areas should be sloped in a manner that minimizes pooling of water on the site, particularly with materials that may leach pollutants into stormwater and/or groundwater, such as compost, logs, and wood chips. A minimum slope of 1.5% is recommended.

- ❑ Curbing or berms should be placed along the perimeter of the area to prevent the run-on of uncontaminated stormwater from adjacent areas as well as runoff of stormwater from stockpile areas.
- ❑ The storm drainage system should be designed to minimize use of catch basins in the interior of the area as they tend to rapidly fill with manufacturing material.

The area should be sloped to drain stormwater to the perimeter where it can be collected or to internal drainage alleyways where material is not stockpiled.

The “doghouse” design has been used to store small liquid containers. The roof and flooring design prevent contact with direct rain or runoff. The doghouse has two solid structural walls and two canvas covered walls. The flooring is wire mesh about secondary containment.

## **References and Resources**

Minnesota Pollution Control Agency, *Industrial Stormwater Best Management Practices Guidebook*. Available online at: <http://www.pca.state.mn.us/index.php/view-document.html?gid=10557>.

New Jersey Department of Environmental Protection, 2013. *Basic Industrial Stormwater General Permit Guidance Document NJPDES General Permit No NJ0088315*. Available online at: [http://www.nj.gov/dep/dwg/pdf/5G2\\_guidance\\_color.pdf](http://www.nj.gov/dep/dwg/pdf/5G2_guidance_color.pdf).

Orange County Stormwater Program, *Best Management Practices for Industrial/Commercial Business Activities*. Available online at: <http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessactivities>

## **Outdoor Storage of Raw Materials SC-33**

Oregon Department of Environmental Quality. 2013. *Industrial Stormwater Best Management Practices Manual*. Available online at:  
<http://www.deq.state.or.us/wq/wqpermit/docs/IndBMP021413.pdf>

Sacramento Stormwater Management Program. *Best Management Practices for Industrial Storm Water Pollution Control*. Available online at:  
<http://www.msa.saccounty.net/sactostormwater/documents/guides/industrial-BMP-manual.pdf>.

Sacramento County Environmental Management Stormwater Program: Best Management Practices. Available online at:  
<http://www.emd.saccounty.net/EnvHealth/Stormwater/Stormwater-BMPs.html>.

Santa Clara Valley Urban Runoff Pollution Prevention Program. <http://www.scvurppp-w2k.com/>.

US EPA. National Pollutant Discharge Elimination System – Industrial Fact Sheet Series for Activities Covered by EPA’s Multi Sector General Permit. Available online at:  
<http://cfpub.epa.gov/npdes/stormwater/swsectors.cfm>.



# Waste Handling & Disposal

# SC-34

## Description

Improper storage and handling of solid wastes can allow toxic compounds, oils and greases, heavy metals, nutrients, suspended solids, and other pollutants to enter stormwater runoff. The discharge of pollutants to stormwater from waste handling and disposal can be prevented and reduced by tracking waste generation, storage, and disposal; reducing waste generation and disposal through source reduction, reuse, and recycling; and preventing run-on and runoff.

## Approach

Reduce potential for pollutant discharge through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

## General Pollution Prevention Protocols

- ❑ Accomplish reduction in the amount of waste generated using the following source controls:
  - ✓ Production planning and sequencing;
  - ✓ Process or equipment modification;
  - ✓ Raw material substitution or elimination;
  - ✓ Loss prevention and housekeeping;
  - ✓ Waste segregation and separation; and
  - ✓ Close loop recycling.
- ❑ Establish a material tracking system to increase awareness about material usage. This may reduce spills and minimize contamination, thus reducing the amount of waste produced.
- ❑ Recycle materials whenever possible.

## Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

## Targeted Constituents

Sediment

Nutrients

Trash

Metals

✓

Bacteria

✓

Oil and Grease

✓

Organics

✓

## Minimum BMPs Covered



Good Housekeeping

✓



Preventative Maintenance

✓



Spill and Leak Prevention and Response

✓



Material Handling & Waste Management

✓



Erosion and Sediment Controls

✓



Employee Training Program

✓



Quality Assurance Record Keeping

✓



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# Waste Handling & Disposal

## SC-34

- ☐ Use the entire product before disposing of the container.
- ☐ To the extent possible, store wastes under cover or indoors after ensuring all safety concerns such as fire hazard and ventilation are addressed.
- ☐ Provide containers for each waste stream at each work station. Allow time after shift to clean area.



### **Good Housekeeping**

- ☐ Cover storage containers with leak proof lids or some other means. If waste is not in containers, cover all waste piles (plastic tarps are acceptable coverage) and prevent stormwater run-on and runoff with a berm. The waste containers or piles must be covered except when in use.
- ☐ Use drip pans or absorbent materials whenever grease containers are emptied by vacuum trucks or other means. Grease cannot be left on the ground. Collected grease must be properly disposed of as garbage.
- ☐ Dispose of rinse and wash water from cleaning waste containers into a sanitary sewer if allowed by the local sewer authority. Do not discharge wash water to the street or storm drain. Clean in a designated wash area that drains to a clarifier.
- ☐ Transfer waste from damaged containers into safe containers.
- ☐ Take special care when loading or unloading wastes to minimize losses. Loading systems can be used to minimize spills and fugitive emission losses such as dust or mist. Vacuum transfer systems can minimize waste loss.
- ☐ Keep the waste management area clean at all times by sweeping and cleaning up spills immediately.
- ☐ Use dry methods when possible (e.g., sweeping, use of absorbents) when cleaning around restaurant/food handling dumpster areas. If water must be used after sweeping/using absorbents, collect water and discharge through grease interceptor to the sewer.
- ☐ Stencil or demarcate storm drains on the facility's property with prohibitive message regarding waste disposal.
- ☐ Cover waste piles with temporary covering material such as reinforced tarpaulin, polyethylene, polyurethane, polypropylene or hypalon.
- ☐ If possible, move the activity indoor after ensuring all safety concerns such as fire hazard and ventilation are addressed.



### **Preventative Maintenance**

- ☐ Prevent stormwater run-on from entering the waste management area by enclosing the area or building a berm around the area.
- ☐ Prevent waste materials from directly contacting rain.

# Waste Handling & Disposal

## SC-34

- ☐ Cover waste piles with temporary covering material such as reinforced tarpaulin, polyethylene, polyurethane, polypropylene or hypalon.
- ☐ Cover the area with a permanent roof if feasible.
- ☐ Cover dumpsters to prevent rain from washing waste out of holes or cracks in the bottom of the dumpster.
- ☐ Check waste containers weekly for leaks and to ensure that lids are on tightly. Replace any that are leaking, corroded, or otherwise deteriorating.
- ☐ Sweep and clean the waste management area regularly. Use dry methods when possible (e.g., sweeping, vacuuming, use of absorbents) when cleaning around restaurant/food handling dumpster areas. If water must be used after sweeping/using absorbents, collect water and discharge through grease interceptor to the sewer.
- ☐ Inspect and replace faulty pumps or hoses regularly to minimize the potential of releases and spills.
- ☐ Repair leaking equipment including valves, lines, seals, or pumps promptly.



### ***Spill Response and Prevention Procedures***

- ☐ Keep your spill prevention and plan up-to-date.
- ☐ Have an emergency plan, equipment and trained personnel ready at all times to deal immediately with major spills.
- ☐ Collect all spilled liquids and properly dispose of them.
- ☐ Store and maintain appropriate spill cleanup materials in a location known to all near the designated wash area.
- ☐ Ensure that vehicles transporting waste have spill prevention equipment that can prevent spills during transport. Spill prevention equipment includes:
  - ✓ Vehicles equipped with baffles for liquid waste; and
  - ✓ Trucks with sealed gates and spill guards for solid waste.



### ***Material Handling and Waste Management***

#### ***Litter Control***

- ☐ Post “No Littering” signs and enforce anti-litter laws.
- ☐ Provide a sufficient number of litter receptacles for the facility.
- ☐ Clean out and cover litter receptacles frequently to prevent spillage.

#### ***Waste Collection***

- ☐ Keep waste collection areas clean.

# Waste Handling & Disposal

## SC-34

- ☐ Inspect solid waste containers for structural damage regularly. Repair or replace damaged containers as necessary.
- ☐ Secure solid waste containers; containers must be closed tightly when not in use.
- ☐ Do not fill waste containers with washout water or any other liquid.
- ☐ Ensure that only appropriate solid wastes are added to the solid waste container. Certain wastes such as hazardous wastes, appliances, fluorescent lamps, pesticides, etc., may not be disposed of in solid waste containers (see chemical/ hazardous waste collection section below).
- ☐ Do not mix wastes; this can cause chemical reactions, make recycling impossible, and complicate disposal. Affix labels to all waste containers.

### *Chemical/Hazardous Wastes*

- ☐ Select designated hazardous waste collection areas on-site.
- ☐ Store hazardous materials and wastes in covered containers and protect them from vandalism.
- ☐ Place hazardous waste containers in secondary containment.
- ☐ Make sure that hazardous waste is collected, removed, and disposed of only at authorized disposal areas.
- ☐ Hazardous waste cannot be reused or recycled; it must be disposed of by a licensed hazardous waste hauler.



### **Employee Training Program**

- ☐ Educate employees about pollution prevention measures and goals.
- ☐ Train employees how to properly handle and dispose of waste using the source control BMPs described above.
- ☐ Train employees and subcontractors in proper hazardous waste management.
- ☐ Use a training log or similar method to document training.
- ☐ Ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.



### **Quality Assurance and Record Keeping**

- ☐ Keep accurate maintenance logs that document minimum BMP activities performed for waste handling and disposal, types and quantities of waste disposed of, and any improvement actions.
- ☐ Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.

# Waste Handling & Disposal

# SC-34

- Establish procedures to complete logs and file them in the central office.

## Potential Capital Facility Costs and Operation & Maintenance Requirements

### Facilities

- Capital costs will vary substantially depending on the size of the facility and the types of waste handled. Significant capital costs may be associated with reducing wastes by modifying processes or implementing closed-loop recycling.
- Many facilities will already have indoor covered areas where waste materials will be stored and will require no additional capital expenditures for providing cover.
- If outdoor storage of wastes is required, construction of berms or other means to prevent stormwater run-on and runoff may require appropriate constructed systems for containment.
- Capital investments will likely be required at some sites if adequate cover and containment facilities do not exist and can vary significantly depending upon site conditions.

### Maintenance

- Check waste containers weekly for leaks and to ensure that lids are on tightly. Replace any that are leaking, corroded, or otherwise deteriorating.
- Sweep and clean the waste management area regularly. Use dry methods when possible (e.g., sweeping, use of absorbents) when cleaning around restaurant/food handling dumpster areas. If water must be used after sweeping/using absorbents, collect water and discharge through grease interceptor to the sewer.
- Inspect and replace faulty pumps or hoses regularly to minimize the potential of releases and spills.
- Repair leaking equipment including valves, lines, seals, or pumps promptly.

## References and Resources

Minnesota Pollution Control Agency, *Industrial Stormwater Best Management Practices Guidebook*. Available online at: <http://www.pca.state.mn.us/index.php/view-document.html?gid=10557>.

New Jersey Department of Environmental Protection, 2013. *Basic Industrial Stormwater General Permit Guidance Document NJPDES General Permit No NJ0088315*, Revised. Available online at: [http://www.nj.gov/dep/dwq/pdf/5G2\\_guidance\\_color.pdf](http://www.nj.gov/dep/dwq/pdf/5G2_guidance_color.pdf).

Orange County Stormwater Program, *Best Management Practices for Industrial/Commercial Business Activities*. Available online at: <http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessesactivities>



## **Waste Handling & Disposal** **SC-34**

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Oregon Department of Environmental Quality, 2013. *Industrial Stormwater Best Management Practices Manual- BMP 26 Fueling and Liquid Loading/Unloading Operations*. Available online at:  
<http://www.deq.state.or.us/wq/wqpermit/docs/IndBMP021413.pdf>.

Sacramento Stormwater Management Program. *Best Management Practices for Industrial Storm Water Pollution Control*. Available online at:  
<http://www.msa.saccounty.net/sactostormwater/documents/guides/industrial-BMP-manual.pdf>.

Sacramento County Environmental Management Stormwater Program: Best Management Practices. Available online at:  
<http://www.emd.saccounty.net/EnvHealth/Stormwater/Stormwater-BMPs.html>.

Santa Clara Valley Urban Runoff Pollution Prevention Program. <http://www.scvurppp-w2k.com/>

US EPA. National Pollutant Discharge Elimination System – Industrial Fact Sheet Series for Activities Covered by EPA’s Multi Sector General Permit. Available online at:  
<http://cfpub.epa.gov/npdes/stormwater/swsectors.cfm>.



# Safer Alternative Products

# SC-35

## Description

Promote the use of less harmful products and products that contain little or no TMDL and 303(d) list pollutants. Alternatives exist for most product classes including chemical fertilizers, pesticides, cleaning solutions, janitorial chemicals, automotive and paint products, and consumables (batteries, fluorescent lamps).

## Approach

Pattern a new program after the many established programs around the state and country. Integrate this best management practice as much as possible with existing programs at your facility.

Develop a comprehensive program based on:

- The "Precautionary Principle," which is an alternative to the "Risk Assessment" model that says it's acceptable to use a potentially harmful product until physical evidence of its harmful effects are established and deemed too costly from an environmental or public health perspective. For instance, a risk assessment approach might say it's acceptable to use a pesticide until there is direct proof of an environmental impact. The Precautionary Principle approach is used to evaluate whether a given product is safe, whether it is really necessary, and whether alternative products would perform just as well.
- Environmentally Preferable Purchasing Program to minimize the purchase of products containing hazardous ingredients used in the facility's custodial services, fleet maintenance, and facility maintenance in favor of using alternate products that pose less risk to employees and to the environment.
- Integrated Pest Management (IPM) or Less-Toxic Pesticide Program, which uses a pest management approach that minimizes the use of toxic chemicals and gets rid of pests

## Objectives

- Educate
- Reduce/Minimize
- Product Substitution

## Targeted Constituents

Sediment	
Nutrients	✓
Trash	
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

## Minimum BMPs Covered

	Good Housekeeping	
	Preventative Maintenance	
	Spill and Leak Prevention and Response	
	Material Handling & Waste Management	
	Erosion and Sediment Controls	
	Employee Training Program	✓
	Quality Assurance Record Keeping	



## Safer Alternative Products

## SC-35

by methods that pose a lower risk to employees, the public, and the environment.

- ❑ Energy Efficiency Program including no-cost and low-cost energy conservation and efficiency actions that can reduce both energy consumption and electricity bills, along with long-term energy efficiency investments.

Consider the following mechanisms for developing and implementing a comprehensive program:

- ❑ Policies
- ❑ Procedures
  - ✓ Standard operating procedures (SOPs);
  - ✓ Purchasing guidelines and procedures; and
  - ✓ Bid packages (services and supplies).
- ❑ Materials
  - ✓ Preferred or approved product and supplier lists;
  - ✓ Product and supplier evaluation criteria;
  - ✓ Training sessions and manuals; and
  - ✓ Fact sheets for employees.

Implement this BMP in conjunction with the Vehicle and Equipment Management fact sheets (SC-20 – SC-22) and SC-41 Building and Grounds Maintenance.



### ***Employee Training Program***

- ❑ Employees who handle potentially harmful materials should be trained in the use of safer alternatives.
- ❑ Purchasing departments should be trained on safer alternative products and encouraged to procure less hazardous materials and products that contain little or no harmful substances or TMDL pollutants.
- ❑ Employees and contractors / service providers can both be educated about safer alternatives by using information developed by a number of organizations including the references and resources provided in this fact sheet.

### **Potential Limitations and Work-Arounds**

Some facilities may have space constraints, limited staffing and time limitations that may preclude implementation of BMPs. Provided below are typical limitations and recommended “work-arounds”

- ❑ Alternative products may not be available, suitable, or effective in every case.

# Safer Alternative Products

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- ✓ Minimize use of hazardous/harmful products if no alternative product is available.

## Regulatory Considerations

This BMP has no regulatory requirements unless local/municipal ordinance applies. Existing regulations already encourage facilities to reduce the use of hazardous materials through incentives such as reduced:

- ❑ Specialized equipment storage and handling requirements;
- ❑ Storm water runoff sampling requirements;
- ❑ Training and licensing requirements; and
- ❑ Record keeping and reporting requirements.

## Cost Considerations

- ❑ The primary cost is for staff time to: 1) develop new policies and procedures and 2) educate purchasing departments and employees who handle potentially harmful materials about the availability, procurement, and use of safer alternatives.
- ❑ Some alternative products may be slightly more expensive than conventional products.

## Supplemental Information

The following discussion provides some general information on safer alternatives. More specific information on particular hazardous materials and the available alternatives may be found in the references and resources listed below.

- ❑ Automotive products – Less toxic alternatives are not available for many automotive products, especially engine fluids. But there are alternatives to grease lubricants, car polishes, degreasers, and windshield washer solution. Refined motor oil is also available.
- ❑ Vehicle/Trailer lubrication – Fifth wheel bearings on trucks require routine lubrication. Adhesive lubricants are available to replace typical chassis grease.
- ❑ Cleaners – Vegetables-based or citrus-based soaps are available to replace petroleum-based soaps/detergents.
- ❑ Paint products – Water-based paints, wood preservatives, stains, and finishes with low VOC content are available.
- ❑ Pesticides – Specific alternative products or methods exist to control most insects, fungi, and weeds.
- ❑ Chemical Fertilizers – Compost and soil amendments are natural alternatives.
- ❑ Consumables – Manufacturers have either reduced or are in the process of reducing the amount of heavy metals in consumables such as batteries and fluorescent lamps.

# Safer Alternative Products

# SC-35

All fluorescent lamps contain mercury, however low-mercury containing lamps are now available from most hardware and lighting stores. Fluorescent lamps are also more energy efficient than the average incandescent lamp.

- Janitorial chemicals – Even biodegradable soap can harm fish and wildlife before it biodegrades. Biodegradable does not mean non-toxic. Safer products and procedures are available for floor stripping and cleaning, as well as carpet, glass, metal, and restroom cleaning and disinfecting. Use paper products with post-consumer recycled content and implement electric hand dryers.

## **Examples**

There are a number of business and trade associations, and communities with effective programs. Some of the more prominent are listed below in the references and resources section.

## **References and Resources**

Note: Many of these references provide alternative products for materials that typically are used inside and disposed to the sanitary sewer as well as alternatives to products that usually end up in the storm drain.

### ***General Sustainable Practices and Pollution Prevention Including Pollutant-Specific Information***

California Department of Toxic Substances Control,  
<http://www.dtsc.ca.gov/PollutionPrevention/GreenTechnology/Index.cfm>.

CalRecycle, <http://www.calrecycle.ca.gov/Business/Regulated.htm>.

City of Santa Monica Office of Sustainability and Environment,  
<http://www.smgov.net/departments/ose/>.

City of Palo Alto, <http://www.city.palo-alto.ca.us/cleanbay>.

City and County of San Francisco, Department of the Environment,  
<http://www.sfenvironment.org/toxics-health/greener-business-practices>.

Green Business Program, <http://www.greenbiz.ca.gov/GRlocal.html>.

Product Stewardship Institute, <http://www.productstewardship.us/index.cfm>.

Sacramento Clean Water Business Partners.  
<http://www.sacstormwater.org/CleanWaterBusinessPartners/CleanWaterBusinessPartners.html>.

USEPA. National Pollutant Discharge Elimination System (NPDES) Stormwater Discharges From Industrial Facilities,  
<http://cfpub.epa.gov/npdes/stormwater/indust.cfm>.

USEPA Region IX Pollution Prevention Program,  
<http://www.epa.gov/region9/waste/p2/business.html>.

## Safer Alternative Products

## SC-35

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Western Sustainability and Pollution Prevention Network, <http://wsppn.org/>.

### ***Metals (mercury, copper)***

National Electrical Manufacturers Association – Environmental Stewardship,  
<http://www.nema.org/Policy/Environmental-Stewardship/pages/default.aspx>.

Sustainable Conservation, <http://www.suscon.org>.

Auto Recycling Project

Brake Pad Partnership

### ***Pesticides and Chemical Fertilizers***

Bio-Integral Resource Center, <http://www.birc.org>.

California Department of Pesticide Regulation,  
<http://www.cdpr.ca.gov/dprprograms.htm>.

University of California Statewide IPM Program,  
<http://www.ipm.ucdavis.edu/default.html>.

### ***Dioxins***

Bay Area Dioxins Project,  
[http://www.abag.ca.gov/bavarea/dioxin/project\\_materials.htm](http://www.abag.ca.gov/bavarea/dioxin/project_materials.htm).



# Contaminated or Erodible Areas SC-40

## Description

Areas within an industrial site that are bare of vegetation or are subject to activities that promote the suppression of vegetation are often subject to erosion. In addition, they may or may not be contaminated from past or current activities. If the area is temporarily bare because of construction, see SC-42 Building Repair, Remodeling, and Construction. Sites with excessive erosion or the potential for excessive erosion should consider employing the soil erosion BMPs identified in the Construction BMP Handbook. Note that this fact sheet addresses soils that do not exceed hazardous waste criteria (see Title 22 California Code of Regulations for Hazardous Waste Criteria).

## Approach

Reduce potential for pollutant discharge through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

## General Pollution Prevention Protocols

Implement erosion and sediment control BMPs to stabilize soils and reduce pollutant discharges from contaminated or erodible surfaces.



## Erosion and Sediment Controls

- ☐ Preserve natural vegetation whenever possible. See also EC-2 Preservation of Existing Vegetation, in the Construction BMP Handbook.
- ☐ Analyze soil conditions.
- ☐ Remove contaminated soil and dispose of properly.
- ☐ Stabilize loose soils by re-vegetating whenever possible. See also EC-4 Hydroseeding, in the Construction BMP Handbook.

## Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

## Targeted Constituents

Sediment	✓
Nutrients	✓
Trash	
Metals	✓
Bacteria	✓
Oil and Grease	✓
Organics	✓

## Minimum BMPs Covered

	Good Housekeeping	
	Preventative Maintenance	
	Spill and Leak Prevention and	
	Material Handling & Waste Management	
	Erosion and Sediment Controls	✓
	Employee Training Program	✓
	Quality Assurance Record Keeping	✓





## Contaminated or Erodible Areas SC-40

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- Utilize non-vegetative stabilization methods for areas prone to erosion where vegetative options are not feasible. Examples include:
  - ✓ Areas of vehicular or pedestrian traffic such as roads or paths;
  - ✓ Arid environments where vegetation would not provide timely ground coverage, or would require excessive irrigation;
  - ✓ Rocky substrate, infertile or droughty soils where vegetation would be difficult to establish; and
  - ✓ Areas where vegetation will not grow adequately within the construction time frame.

There are several non-vegetative stabilization methods and selection should be based on site-specific conditions. See also EC-16 Non-Vegetative Stabilization, in the Construction BMP Handbook.

- Utilize chemical stabilization when needed. See also EC-5 Soil Binders, in the Construction BMP Handbook.
- Use geosynthetic membranes to control erosion if feasible. See also EC-7 Geotextiles and Mats, in the Construction BMP Handbook.
- Stabilize all roadways, entrances, and exits to sufficiently control discharges of erodible materials from discharging or being tracked off the site. See also TC 1-3 Tracking Control, in the Construction BMP Handbook.
- Implement wind erosion control measures as necessary. See also WE-1 Wind Erosion Control, in the Construction BMP Handbook.



### ***Employee Training Program***

- Educate employees about pollution prevention measures and goals.
- Train employees how to properly install and maintain the erosion and sediment source control BMPs described above. Detailed information is provided in the Construction BMP Handbook.
- Use a training log or similar method to document training.



### ***Quality Assurance and Record Keeping***

- Keep accurate logs that document actions taken to maintain and improve the effectiveness of the erosion and sediment control BMPs described above.
- Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.
- Establish procedures to complete logs and file them in the central office.

# Contaminated or Erodible Areas SC-40

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## Potential Capital Facility Costs and Operation & Maintenance Requirements

### *Facilities*

- Many facilities do not have contaminated or erodible areas and will require no additional capital expenditures.
- For sites with contaminated or erodible areas, purchase and installation of erosion and sediment controls will require additional capital investments, and this amount will vary depending on site characteristics and the types of BMPs being implemented.
- Minimize costs by maintaining existing vegetation and limiting site operations on bare soils.

### *Maintenance*

- The erosion and sediment control BMPs described above require periodic inspection and maintenance to remain effective. The cost of these actions will vary depending on site characteristics and the types of BMPs being implemented.
- Irrigation costs may be required to establish and maintain vegetation.

## Supplemental Information

### *Stabilization of Erodible Areas*

Preserving stabilized areas minimizes erosion potential, protects water quality, and provides aesthetic benefits. The most effective way to control erosion is to preserve existing vegetation. Preservation of natural vegetation provides a natural buffer zone and an opportunity for infiltration of stormwater and capture of pollutants in the soil matrix. This practice can be used as a permanent source control measure.

Vegetation preservation should be incorporated into the site. Preservation requires good site management to minimize operations on bare soils where vegetation exists. Proper maintenance is important to ensure healthy vegetation that can control erosion. Different species, soil types, and climatic conditions will require different maintenance activities such as mulching, fertilizing, liming, irrigation, pruning and weed and pest control.

The preferred approach is to leave as much native vegetation on-site as possible, thereby reducing or eliminating any erosion problem. However, assuming the site already has contaminated or erodible surface areas, there are four possible courses of action which can be taken:

- The area can be revegetated if it is not in use and therefore not subject to damage from site activities. In as much as the area is already devoid of vegetation, special measures are likely necessary. Lack of vegetation may be due to the lack of water and/or poor soils. The latter can perhaps be solved with fertilization, or the ground may simply be too compacted from prior use. Improving soil conditions may be sufficient to support the recovery of vegetation. Use process wastewater for irrigation if possible, and see the Construction BMP Handbook for further procedures on establishing vegetation.

## Contaminated or Erodible Areas SC-40

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- Watering trucks to prevent dust.
- Chemical stabilization can be used as an alternate method in areas where temporary seeding practices cannot be used because of season or climate. It can provide immediate, effective, and inexpensive erosion control. Application rates and procedures recommended by the manufacturer should be followed as closely as possible to prevent the products from forming ponds and creating large areas where moisture cannot penetrate the soil. See also EC-5, Soil Binders, in the Construction BMP Handbook for more information. Advantages of chemical stabilization include:
  - ✓ Applied easily to the surface;
  - ✓ Stabilizes areas effectively; and
  - ✓ Provides immediate protection to soils that are in danger of erosion.
- Contaminated soils should be cleaned up or removed. This requires determination of the level and extent of the contamination. Removal must comply with State and Federal regulations; permits must be acquired and fees paid.
- Non-vegetated stabilization methods are suitable for permanently protecting from erosion by water and wind. Non-vegetated stabilization should only be utilized when vegetation cannot be established due to soil or climactic conditions, or where vegetation may be a potential fire hazard.

Examples of non-vegetative stabilization BMPs are provided below:

- ✓ **Decomposed Granite (DG) and Gravel Mulch** are suitable for use in areas where vegetation establishment is difficult, on flat surfaces, trails and pathways, and when used in conjunction with a stabilizer or tackifier, on shallow slopes (i.e., 10:1 [H:V]). DG and gravel can also be used on shallow rocky slopes where vegetation cannot be established for permanent erosion control.
- ✓ **Degradable Mulches** can be used to cover and protect soil surfaces from erosion both in temporary and permanent applications. In many cases, the use of mulches by themselves requires routine inspection and re-application. See EC-3 Hydraulic Mulch, EC-6 Straw Mulch, EC-8 Wood Mulch, or EC-14 Compost Blankets of the Construction BMP Handbook for more information.
- ✓ **Geotextiles and Mats** can be used as a temporary stand-alone soil stabilization method. Depending on material selection, geotextiles and mats can be a short-term (3 months – 1 year) or long-term (1-2 years) temporary stabilization method. For more information on geotextiles and mats see EC-7 Geotextiles and Mats of the Construction BMP Handbook.
- ✓ **Rock Slope Protection** can be used when the slopes are subject to scour or have a high erosion potential, such as slopes adjacent to flowing waterways or slopes subject to overflow from detention facilities (spillways).

## **Contaminated or Erodible Areas SC-40**

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- ✓ **Soil Binders** can be used for temporary stabilization of stockpiles and disturbed areas not subject to heavy traffic. See EC-5 Soil Binders for more information. References and Resources.

### **References and Resources**

California Stormwater Quality Association 2012, *Construction Stormwater Best Management Practice Handbook*. Available at <http://www.casqa.org>.

City of Seattle, Seattle Public Utilities Department of Planning and Development, 2009. *Stormwater Manual Vol. 1 Source Control Technical Requirements Manual*.

Orange County Stormwater Program, Best Management Practices for Industrial/Commercial Business Activities. Available online at: <http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessesactivities>.

Sacramento Stormwater Management Program. *Best Management Practices for Industrial Storm Water Pollution Control*. Available online at: <http://www.msa.saccounty.net/sactostormwater/documents/guides/industrial-BMP-manual.pdf>.

Santa Clara Valley Urban Runoff Pollution Prevention Program, <http://www.scvurppp-w2k.com/>.

Tahoe Regional Planning Agency, *Best Management Practices Handbook*, 2012. Available online at: <http://www.tahoebmp.org/Documents/2012%20BMP%20Handbook.pdf>.

The Storm Water Managers Resource Center, <http://www.stormwatercenter.net>.

U.S. Environmental Protection Agency, *Construction Site Stormwater Runoff Control*. Available online at: [http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min\\_measure&min\\_measure\\_id=4](http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min_measure&min_measure_id=4).

# Building & Grounds Maintenance SC-41

## Description

Stormwater runoff from building and grounds maintenance activities can be contaminated with toxic hydrocarbons in solvents, fertilizers and pesticides, suspended solids, heavy metals, abnormal pH, and oils and greases. Utilizing the protocols in this fact sheet will prevent or reduce the discharge of pollutants to stormwater from building and grounds maintenance activities by washing and cleaning up with as little water as possible, following good landscape management practices, preventing and cleaning up spills immediately, keeping debris from entering the storm drains, and maintaining the stormwater collection system.

## Approach

Reduce potential for pollutant discharge through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

## General Pollution Prevention Protocols

- ☐ Switch to non-toxic chemicals for maintenance to the maximum extent possible.
- ☐ Choose cleaning agents that can be recycled.
- ☐ Encourage proper lawn management and landscaping, including use of native vegetation.
- ☐ Encourage use of Integrated Pest Management techniques for pest control.
- ☐ Encourage proper onsite recycling of yard trimmings.
- ☐ Recycle residual paints, solvents, lumber, and other material as much as possible.

## Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

## Targeted Constituents

Sediment	✓
Nutrients	✓
Trash	
Metals	✓
Bacteria	✓
Oil and Grease	
Organics	

## Minimum BMPs Covered

	Good Housekeeping	✓
	Preventative Maintenance	
	Spill and Leak Prevention and Response	✓
	Material Handling & Waste Management	✓
	Erosion and Sediment Controls	
	Employee Training Program	✓
	Quality Assurance Record Keeping	✓





## **Building & Grounds Maintenance SC-41**

- Clean work areas at the end of each work shift using dry cleaning methods such as sweeping and vacuuming.



### ***Good Housekeeping***

#### ***Pressure Washing of Buildings, Rooftops, and Other Large Objects***

- In situations where soaps or detergents are used and the surrounding area is paved, pressure washers must use a water collection device that enables collection of wash water and associated solids. A sump pump, wet vacuum or similarly effective device must be used to collect the runoff and loose materials. The collected runoff and solids must be disposed of properly.
- If soaps or detergents are not used, and the surrounding area is paved, wash runoff does not have to be collected but must be screened. Pressure washers must use filter fabric or some other type of screen on the ground and/or in the catch basin to trap the particles in wash water runoff.
- If you are pressure washing on a grassed area (with or without soap), runoff must be dispersed as sheet flow as much as possible, rather than as a concentrated stream. The wash runoff must remain on the grass and not drain to pavement.

#### ***Landscaping Activities***

- Dispose of grass clippings, leaves, sticks, or other collected vegetation as garbage, or by composting. Do not dispose of collected vegetation into waterways or storm drainage systems.
- Use mulch or other erosion control measures on exposed soils. See also SC-40, Contaminated and Erodible Areas, for more information.

#### ***Building Repair, Remodeling, and Construction***

- Do not dump any toxic substance or liquid waste on the pavement, the ground, or toward a storm drain.
- Use ground or drop cloths underneath outdoor painting, scraping, and sandblasting work, and properly dispose of collected material daily.
- Use a ground cloth or oversized tub for activities such as paint mixing and tool cleaning.
- Clean paintbrushes and tools covered with water-based paints in sinks connected to sanitary sewers or in portable containers that can be dumped into a sanitary sewer drain. Brushes and tools covered with non-water-based paints, finishes, or other materials must be cleaned in a manner that enables collection of used solvents (e.g., paint thinner, turpentine, etc.) for recycling or proper disposal.
- Use a storm drain cover, filter fabric, or similarly effective runoff control mechanism if dust, grit, wash water, or other pollutants may escape the work area and enter a catch basin. This is particularly necessary on rainy days. The containment device(s) must be in place at the beginning of the work day, and accumulated dirty runoff and

## **Building & Grounds Maintenance SC-41**

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solids must be collected and disposed of before removing the containment device(s) at the end of the work day.

- ❑ If you need to de-water an excavation site, you may need to filter the water before discharging to a catch basin or off-site. If directed off-site, you should direct the water through hay bales and filter fabric or use other sediment filters or traps.
- ❑ Store toxic material under cover during precipitation events and when not in use. A cover would include tarps or other temporary cover material.

### *Mowing, Trimming, and Planting*

- ❑ Dispose of leaves, sticks, or other collected vegetation as garbage, by composting or at a permitted landfill. Do not dispose of collected vegetation into waterways or storm drainage systems.
- ❑ Use mulch or other erosion control measures when soils are exposed.
- ❑ Place temporarily stockpiled material away from watercourses and drain inlets, and berm or cover stockpiles to prevent material releases to the storm drain system.
- ❑ Consider an alternative approach when bailing out muddy water: do not put it in the storm drain; pour over landscaped areas.
- ❑ Use hand weeding where practical.

### *Fertilizer and Pesticide Management*

- ❑ Do not use pesticides if rain is expected.
- ❑ Do not mix or prepare pesticides for application near storm drains.
- ❑ Use the minimum amount needed for the job.
- ❑ Calibrate fertilizer distributors to avoid excessive application.
- ❑ Employ techniques to minimize off-target application (e.g., spray drift) of pesticides, including consideration of alternative application techniques.
- ❑ Apply pesticides only when wind speeds are low.
- ❑ Fertilizers should be worked into the soil rather than dumped or broadcast onto the surface.
- ❑ Irrigate slowly to prevent runoff and then only as much as is needed.
- ❑ Clean pavement and sidewalk if fertilizer is spilled on these surfaces before applying irrigation water.

### *Inspection*

- ❑ Inspect irrigation system periodically to ensure that the right amount of water is being applied and that excessive runoff is not occurring. Minimize excess watering and repair leaks in the irrigation system as soon as they are observed.

# Building & Grounds Maintenance SC-41



## ***Spill Response and Prevention Procedures***

- ☐ Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- ☐ Place a stockpile of spill cleanup materials, such as brooms, dustpans, and vacuum sweepers (if desired) near the storage area where it will be readily accessible.
- ☐ Have employees trained in spill containment and cleanup present during the loading/unloading of dangerous wastes, liquid chemicals, or other materials.
- ☐ Familiarize employees with the Spill Prevention Control and Countermeasure Plan.
- ☐ Clean up spills immediately.



## ***Material Handling and Waste Management***

- ☐ Follow all federal, state, and local laws and regulations governing the use, storage, and disposal of fertilizers and pesticides and training of applicators and pest control advisors.
- ☐ Use less toxic pesticides that will do the job when applicable. Avoid use of copper-based pesticides if possible.
- ☐ Dispose of empty pesticide containers according to the instructions on the container label.
- ☐ Use up the pesticides. Rinse containers, and use rinse water as product. Dispose of unused pesticide as hazardous waste.
- ☐ Implement storage requirements for pesticide products with guidance from the local fire department and County Agricultural Commissioner. Provide secondary containment for pesticides.



## ***Employee Training Program***

- ☐ Educate and train employees on pesticide use and in pesticide application techniques to prevent pollution.
- ☐ Train employees and contractors in proper techniques for spill containment and cleanup.
- ☐ Be sure the frequency of training takes into account the complexity of the operations and the needs of individual staff.



## ***Quality Assurance and Record Keeping***

- ☐ Keep accurate logs that document maintenance activities performed and minimum BMP measures implemented.
- ☐ Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.
- ☐ Establish procedures to complete logs and file them in the central office.

# Building & Grounds Maintenance SC-41

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## Potential Capital Facility Costs and Operation & Maintenance Requirements

### *Facilities*

- Additional capital costs are not anticipated for building and grounds maintenance. Implementation of the minimum BMPs described above should be conducted as part of regular site operations.

### *Maintenance*

- Maintenance activities for the BMPs described above will be minimal, and no additional cost is anticipated.

## Supplemental Information

### *Fire Sprinkler Line Flushing*

Site fire sprinkler line flushing may be a source of non-stormwater runoff pollution. The water entering the system is usually potable water, though in some areas it may be non-potable reclaimed wastewater. There are subsequent factors that may drastically reduce the quality of the water in such systems. Black iron pipe is usually used since it is cheaper than potable piping, but it is subject to rusting and results in lower quality water. Initially, the black iron pipe has an oil coating to protect it from rusting between manufacture and installation; this will contaminate the water from the first flush but not from subsequent flushes. Nitrates, poly-phosphates and other corrosion inhibitors, as well as fire suppressants and antifreeze may be added to the sprinkler water system. Water generally remains in the sprinkler system a long time (typically a year) and between flushes may accumulate iron, manganese, lead, copper, nickel, and zinc. The water generally becomes anoxic and contains living and dead bacteria and breakdown products from chlorination. This may result in a significant BOD problem and the water often smells. Consequently dispose fire sprinkler line flush water into the sanitary sewer. Do not allow discharge to storm drain or infiltration due to potential high levels of pollutants in fire sprinkler line water.

## References and Resources

City of Seattle, Seattle Public Utilities Department of Planning and Development, 2009. *Stormwater Manual Vol. 1 Source Control Technical Requirements Manual*.

Kennedy/Jenks Consultants, 2007. *The Truckee Meadows Industrial and Commercial Storm Water Best Management Practices Handbook*. Available online at: [http://www.cityofsparks.us/sites/default/files/assets/documents/env-control/construction/TM-I-C\\_BMP\\_Handbook\\_2-07-final.pdf](http://www.cityofsparks.us/sites/default/files/assets/documents/env-control/construction/TM-I-C_BMP_Handbook_2-07-final.pdf).

Orange County Stormwater Program, Best Management Practices for Industrial/Commercial Business Activities. Available online at: <http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessactivities>.

Sacramento Stormwater Management Program. *Best Management Practices for Industrial Storm Water Pollution Control*. Available online at:

## **Building & Grounds Maintenance SC-41**

<http://www.msa.saccounty.net/sactostormwater/documents/guides/industrial-BMP-manual.pdf>.

US EPA, 1997. *Best Management Practices Handbook for Hazardous Waste Containers*. Available online at: <http://www.epa.gov/region6/6en/h/handbk4.pdf>.

Ventura Countywide Stormwater Management Program Clean Business Fact Sheets. Available online at: [http://www.vcstormwater.org/documents/programs\\_business/building.pdf](http://www.vcstormwater.org/documents/programs_business/building.pdf).



# Building Repair and Construction SC-42

## Description

Site modifications are common, particularly at large industrial sites. The activity may vary from minor and normal building repair to major remodeling, or the construction of new facilities. These activities can generate pollutants including solvents, paints, paint and varnish removers, finishing residues, spent thinners, soap cleaners, kerosene, asphalt and concrete materials, adhesive residues, and old asbestos installation. Protocols in this fact sheet are intended to prevent or reduce the discharge of pollutants to stormwater from building repair, remodeling, and minor construction by using soil erosion controls, enclosing or covering building material storage areas, using good housekeeping practices, using safer alternative products, and training employees.

This fact sheet is intended to be used for minor repairs and construction. If major construction is required, the guidelines in the Construction BMP Handbook should be followed.

## Approach

The BMP approach is to reduce potential for pollutant discharges through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

## General Pollution Prevention Protocols

- ☐ Recycle residual paints, solvents, lumber, and other materials to the maximum extent practicable.
- ☐ Avoid outdoor repairs and construction during periods of wet weather.
- ☐ Use safer alternative products to the maximum extent practicable. See also SC-35 Safer Alternative Products for more information.

## Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

## Targeted Constituents

<i>Sediment</i>	✓
<i>Nutrients</i>	
<i>Trash</i>	✓
<i>Metals</i>	✓
<i>Bacteria</i>	
<i>Oil and Grease</i>	✓
<i>Organics</i>	✓

## Minimum BMPs Covered

	<i>Good Housekeeping</i>	✓
	<i>Preventative Maintenance</i>	
	<i>Spill and Leak Prevention and Response</i>	✓
	<i>Material Handling &amp; Waste Management</i>	✓
	<i>Erosion and Sediment Controls</i>	✓
	<i>Employee Training Program</i>	✓
	<i>Quality Assurance Record Keeping</i>	✓



## Building Repair and Construction SC-42

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- ❑ Buy recycled products to the maximum extent practicable.
- ❑ Inform on-site contractors of company policy on these matters and include appropriate provisions in their contract to ensure certain proper housekeeping and disposal practices are implemented.
- ❑ Make sure that nearby storm drains are well marked to minimize the chance of inadvertent disposal of residual paints and other liquids.



### **Good Housekeeping**

#### *Repair & Remodeling*

- ❑ Keep the work site clean and orderly. Remove debris in a timely fashion. Sweep and vacuum the area regularly to remove sediments and small debris.
- ❑ Cover raw materials of particular concern that must be left outside, particularly during the rainy season. See also SC-33 Outdoor Storage of Raw Materials for more information.
- ❑ Use equipment and tools such as bag sanders to reduce accumulation of debris.
- ❑ Limit/prohibit work on windy days; implement roll-down walls or other measures to reduce wind transport of pollutants.
- ❑ Do not dump waste liquids down the storm drain.
- ❑ Dispose of wash water, sweepings, and sediments properly.
- ❑ Store liquid materials properly that are normally used in repair and remodeling such as paints and solvents. See also SC-31 Outdoor Liquid Container Storage for more information.
- ❑ Sweep out rain gutters or wash the gutter and trap the particles at the outlet of the downspout. A sock or geofabric placed over the outlet may effectively trap the materials. If the downspout is tight lined, place a temporary plug at the first convenient point in the storm drain and pump out the water with a vactor truck, and clean the catch basin sump where you placed the plug.
- ❑ Clean the storm drain system in the immediate vicinity of the construction activity after it is completed. See also SC-44 Drainage System Maintenance for more information.

#### *Painting*

- ❑ Enclose painting operations consistent with local air quality regulations and OSHA.
- ❑ Local air pollution regulations may, in many areas of the state, specify painting procedures which if properly carried out are usually sufficient to protect water quality.
- ❑ Develop paint handling procedures for proper use, storage, and disposal of paints.

## **Building Repair and Construction SC-42**

- ☐ Transport paint and materials to and from job sites in containers with secure lids and tied down to the transport vehicle.
- ☐ Test and inspect spray equipment prior to starting to paint. Tighten all hoses and connections and do not overfill paint containers.
- ☐ Mix paint indoors before using so that any spill will not be exposed to rain. Do so even during dry weather because cleanup of a spill will never be 100 percent effective.
- ☐ Transfer and load paint and hot thermoplastic away from storm drain inlets.
- ☐ Do not transfer or load paint near storm drain inlets.
- ☐ Plug nearby storm drain inlets prior to starting painting and remove plugs when job is complete when there is risk of a spill reaching storm drains.
- ☐ Cover nearby storm drain inlets prior to starting work if sand blasting is used to remove paint.
- ☐ Use a ground cloth to collect the chips if painting requires scraping or sand blasting of the existing surface. Dispose of the residue properly.
- ☐ Cover or enclose painting operations properly to avoid drift.
- ☐ Clean the application equipment in a sink that is connected to the sanitary sewer if using water based paints.
- ☐ Capture all cleanup-water and dispose of properly.
- ☐ Dispose of paints containing lead or tributyl tin and considered a hazardous waste properly.
- ☐ Store leftover paints if they are to be kept for the next job properly, or dispose properly.
- ☐ Recycle paint when possible. Dispose of paint at an appropriate household hazardous waste facility.



### ***Spill Response and Prevention Procedures***

- ☐ Keep your spill prevention and control plan up-to-date.
- ☐ Place a stockpile of spill cleanup materials where it will be readily accessible.
- ☐ Clean up spills immediately.
- ☐ Excavate and remove the contaminated (stained) soil if a spill occurs on dirt.



### ***Material Handling and Waste Management***

- ☐ Post "No Littering" signs and enforce anti-litter laws.

## **Building Repair and Construction SC-42**

- ❑ Provide a sufficient number of litter receptacles for the facility.
- ❑ Clean out and cover litter receptacles frequently to prevent spillage.
- ❑ Keep waste collection areas clean.
- ❑ Inspect solid waste containers for structural damage regularly. Repair or replace damaged containers as necessary.
- ❑ Secure solid waste containers; containers must be closed tightly when not in use.
- ❑ Do not fill waste containers with washout water or any other liquid.
- ❑ Ensure that only appropriate solid wastes are added to the solid waste container. Certain wastes such as hazardous wastes, appliances, fluorescent lamps, pesticides, etc., may not be disposed of in solid waste containers (see chemical/ hazardous waste collection section below).
- ❑ Do not mix wastes; this can cause chemical reactions, make recycling impossible, and complicate disposal. Affix labels to all waste containers.
- ❑ Make sure that hazardous waste is collected, removed, and disposed of properly. See also SC-34, Waste Handling and Disposal for more information.



### ***Sediment and Erosion Controls***

- ❑ Limit disturbance to bare soils and preserve natural vegetation whenever possible. See also EC-2, Preservation of Existing Vegetation, in the Construction BMP Handbook.
- ❑ Stabilize loose soils by re-vegetating whenever possible. See also EC-4 Hydroseeding, in the Construction BMP Handbook.
- ❑ Utilize non-vegetative stabilization methods for areas prone to erosion where vegetative options are not feasible. Examples include:
  - ✓ Areas of vehicular or pedestrian traffic such as roads or paths;
  - ✓ Arid environments where vegetation would not provide timely ground coverage, or would require excessive irrigation;
  - ✓ Rocky substrate, infertile or droughty soils where vegetation would be difficult to establish; and
  - ✓ Areas where vegetation will not grow adequately within the construction time frame.

There are several non-vegetative stabilization methods and selection should be based on site-specific conditions. See also EC-16 Non-Vegetative Stabilization, in the Construction BMP Handbook.

## Building Repair and Construction SC-42

- ❑ Utilize chemical stabilization when needed. See also EC-5 Soil Binders, in the Construction BMP Handbook.
- ❑ Use geosynthetic membranes to control erosion if feasible. See also EC-7 Geotextiles and Mats, in the Construction BMP Handbook.
- ❑ Stabilize all roadways, entrances, and exits to sufficiently control discharges of erodible materials from discharging or being tracked off the site. See also TC 1-3 Tracking Control, in the Construction BMP Handbook.
- ❑ Refer to the supplemental information provided below for projects that involve more extensive soil disturbance activities.



### ***Employee Training Program***

- ❑ Educate employees about pollution prevention measures and goals.
- ❑ Train employees how to properly implement the source control BMPs described above. Detailed information for Sediment and Erosion Control BMPs is provided in the Construction BMP Handbook.
- ❑ Proper education of off-site contractors is often overlooked. The conscientious efforts of well trained employees can be lost by unknowing off-site contractors, so make sure they are well informed about pollutant source control responsibilities.
- ❑ Use a training log or similar method to document training.



### ***Quality Assurance and Record Keeping***

- ❑ Keep accurate maintenance logs that document minimum BMP activities performed for building repair and construction, types and quantities of waste disposed of, and any improvement actions.
- ❑ Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.
- ❑ Establish procedures to complete logs and file them in the central office.

### **Potential Limitations and Work-Arounds**

Some facilities may have space constraints, limited staffing and time limitations that may preclude implementation of BMPs. Provided below are typical limitations and recommended “work-arounds.”

- ❑ This BMP is for minor construction only. The State’s General Construction Activity Stormwater Permit has more extensive requirements for larger projects that would disturb one or more acres of surface.
  - ✓ Refer to the companion “Construction Best Management Practice Handbook” which contains specific guidance and best management practices for larger-scale projects.



## **Building Repair and Construction SC-42**

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- Time constraints may require some outdoor repairs and construction during wet weather.
  - ✓ Require employees to understand and follow good housekeeping and spill and leak prevention BMPs.
  - ✓ Inspect sediment and erosion control BMPs daily during periods of wet weather and repair or improve BMP implementation as necessary.
- Hazardous waste that cannot be reused or recycled must be disposed of by a licensed hazardous waste hauler.
  - ✓ Minimize use of hazardous materials to the maximum extent practicable.
- Be certain that actions to help stormwater quality are consistent with Cal- and Fed-OSHA and air quality regulations.
- Prices for recycled/safer alternative materials and fluids may be higher than those of conventional materials.

### **Potential Capital Facility Costs and Operation & Maintenance Requirements**

#### ***Facilities***

- Limited capital investments may be required at some sites if adequate cover and containment facilities do not exist for construction materials and wastes.
- Purchase and installation of erosion and sediment controls, if needed will require additional capital investments, and this amount will vary depending on site characteristics and the types of BMPs being implemented.
- Minimize costs by maintaining existing vegetation and limiting construction operations on bare soils.

#### ***Maintenance***

- The erosion and sediment control BMPs described above require periodic inspection and maintenance to remain effective. The cost of these actions will vary depending on site characteristics and the types of BMPs being implemented.
- Irrigation costs may be required to establish and maintain vegetation.

### **Supplemental Information**

#### ***Soil/Erosion Control***

If the work involves exposing large areas of soil, employ the appropriate soil erosion and control techniques. See the Construction Best Management Practice Handbook. If old buildings are being torn down and not replaced in the near future, stabilize the site using measures described in SC-40 Contaminated or Erodible Areas.

## Building Repair and Construction SC-42

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If a building is to be placed over an open area with a storm drainage system, make sure the storm inlets within the building are covered or removed, or the storm line is connected to the sanitary sewer. If because of the remodeling a new drainage system is to be installed or the existing system is to be modified, consider installing catch basins as they serve as effective “in-line” treatment devices. Include in the catch basin a “turn-down” elbow or similar device to trap floatables.

### References and Resources

City of Seattle, Seattle Public Utilities Department of Planning and Development, 2009. *Stormwater Manual Vol. 1 Source Control Technical Requirements Manual*.

California Stormwater Quality Association, 2012. *Construction Stormwater Best Management Practice Handbook*. Available at <http://www.casqa.org>.

Kennedy/Jenks Consultants, 2007. *The Truckee Meadows Industrial and Commercial Storm Water Best Management Practices Handbook*. Available online at: [http://www.cityofsparks.us/sites/default/files/assets/documents/env-control/construction/TM-I-C BMP Handbook 2-07-final.pdf](http://www.cityofsparks.us/sites/default/files/assets/documents/env-control/construction/TM-I-C_BMP_Handbook_2-07-final.pdf).

Sacramento Stormwater Management Program. *Best Management Practices for Industrial Storm Water Pollution Control*. Available online at: <http://www.msa.saccounty.net/sactostormwater/documents/guides/industrial-BMP-manual.pdf>.

US EPA. *Construction Site Stormwater Runoff Control*. Available online at: [http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min\\_measure&min\\_measure\\_id=4](http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min_measure&min_measure_id=4).

# Parking Area Maintenance

# SC-43

## Description

Parking lots can contribute a number of substances, such as trash, suspended solids, hydrocarbons, oil and grease, and heavy metals that can enter receiving waters through stormwater runoff or non-stormwater discharges. The protocols in this fact sheet are intended to prevent or reduce the discharge of pollutants from parking areas and include using good housekeeping practices, following appropriate cleaning BMPs, and training employees.

BMPs for other outdoor areas on site (loading/unloading, material storage, and equipment operations) are described in SC-30 through SC-33.

## Approach

The goal of this program is to ensure stormwater pollution prevention practices are considered when conducting activities on or around parking areas to reduce potential for pollutant discharge to receiving waters. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

## General Pollution Prevention Protocols

- ☐ Encourage advanced designs and maintenance strategies for impervious parking lots. Refer to the treatment control BMP fact sheets in this manual for additional information.
- ☐ Keep accurate maintenance logs to evaluate BMP implementation.



## Good Housekeeping

- ☐ Keep all parking areas clean and orderly. Remove debris, litter, and sediments in a timely fashion.
- ☐ Post "No Littering" signs and enforce anti-litter laws.

## Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

## Targeted Constituents

<i>Sediment</i>	✓
<i>Nutrients</i>	
<i>Trash</i>	✓
<i>Metals</i>	✓
<i>Bacteria</i>	
<i>Oil and Grease</i>	✓
<i>Organics</i>	✓

## Minimum BMPs Covered

	<i>Good Housekeeping</i>	✓
	<i>Preventative Maintenance</i>	✓
	<i>Spill and Leak Prevention and Response</i>	✓
	<i>Material Handling &amp; Waste Management</i>	
	<i>Erosion and Sediment Controls</i>	
	<i>Employee Training Program</i>	✓
	<i>Quality Assurance Record Keeping</i>	✓



# Parking Area Maintenance

## SC-43

- ☐ Provide an adequate number of litter receptacles.
- ☐ Clean out and cover litter receptacles frequently to prevent spillage.



### **Preventative Maintenance**

#### *Inspection*

Have designated personnel conduct inspections of parking facilities and stormwater conveyance systems associated with parking facilities on a regular basis.

- ☐ Inspect cleaning equipment/sweepers for leaks on a regular basis.

#### *Surface Cleaning*

- ☐ Use dry cleaning methods (e.g., sweeping, vacuuming) to prevent the discharge of pollutants into the stormwater conveyance system if possible.
- ☐ Establish frequency of public parking lot sweeping based on usage and field observations of waste accumulation.
- ☐ Sweep all parking lots at least once before the onset of the wet season.
- ☐ Dispose of parking lot sweeping debris and dirt at a landfill.
- ☐ Follow the procedures below if water is used to clean surfaces:
  - ✓ Block the storm drain or contain runoff.
  - ✓ Collect and pump wash water to the sanitary sewer or discharge to a pervious surface. Do not allow wash water to enter storm drains.
- ☐ Follow the procedures below when cleaning heavy oily deposits:
  - ✓ Clean oily spots with absorbent materials.
  - ✓ Use a screen or filter fabric over inlet, then wash surfaces.
  - ✓ Do not allow discharges to the storm drain.
  - ✓ Vacuum/pump discharges to a tank or discharge to sanitary sewer.
  - ✓ Dispose of spilled materials and absorbents appropriately.

#### *Surface Repair*

- ☐ Check local ordinance for SUSMP/LID ordinance.
- ☐ Preheat, transfer or load hot bituminous material away from storm drain inlets.
- ☐ Apply concrete, asphalt, and seal coat during dry weather to prevent contamination from contacting stormwater runoff.
- ☐ Cover and seal nearby storm drain inlets where applicable (with waterproof material or mesh) and manholes before applying seal coat, slurry seal, etc. Leave covers in

# Parking Area Maintenance

# SC-43

place until job is complete and all water from emulsified oil sealants has drained or evaporated. Clean any debris from these covered manholes and drains for proper disposal.

- ☐ Use only as much water as necessary for dust control during sweeping to avoid runoff.
- ☐ Catch drips from paving equipment that is not in use with pans or absorbent material placed under the machines. Dispose of collected material and absorbents properly.



## ***Spill Response and Prevention Procedures***

- ☐ Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- ☐ Place a stockpile of spill cleanup materials where it will be readily accessible or at a central location.
- ☐ Clean up fluid spills immediately with absorbent rags or material.
- ☐ Dispose of spilled material and absorbents properly.



## ***Employee Training Program***

- ☐ Provide regular training to field employees and/or contractors regarding cleaning of paved areas and proper operation of equipment.
- ☐ Train employees and contractors in proper techniques for spill containment and cleanup.
- ☐ Use a training log or similar method to document training.



## ***Quality Assurance and Record Keeping***

- ☐ Keep accurate maintenance logs that document minimum BMP activities performed for parking area maintenance, types and quantities of waste disposed of, and any improvement actions.
- ☐ Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.
- ☐ Establish procedures to complete logs and file them in the central office.

## **Potential Capital Facility Costs and Operation & Maintenance Requirements**

### ***Facilities***

- ☐ Capital investments may be required at some sites to purchase sweeping equipment, train sweeper operators, install oil/water/sand separators, or implement advanced BMPs. These costs can vary significantly depending upon site conditions and the amount of BMPs required.



# Parking Area Maintenance SC-43

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## ***Maintenance***

- ❑ Sweep and clean parking lots regularly to minimize pollutant transport into storm drains from stormwater runoff.
- ❑ Clean out oil/water/sand separators regularly, especially after heavy storms.
- ❑ Maintain advanced BMPs such as vegetated swales, infiltration trenches, or detention basins as appropriate. Refer to the treatment control fact sheets for more information.

## **Supplemental Information**

### ***Advanced BMPs***

Some parking areas may require advanced BMPs to further reduce pollutants in stormwater runoff, and a few examples are listed below. Refer to the Treatment Control Fact Sheets and the New Development and Redevelopment Manual for more information.

- ❑ When possible, direct sheet runoff to flow into biofilters (vegetated strip and swale) and/or infiltration devices.
- ❑ Utilize sand filters or oleophilic collectors for oily waste in low quantities.
- ❑ Arrange rooftop drains to prevent drainage directly onto paved surfaces.
- ❑ Design lot to include semi-permeable hardscape.

## **References and Resources**

City of Seattle, Seattle Public Utilities Department of Planning and Development, 2009. *Stormwater Manual Vol. 1 Source Control Technical Requirements Manual*.

California Stormwater Quality Association, 2003. *New Development and Redevelopment Stormwater Best Management Practice Handbook*. Available online at: <https://www.casqa.org/resources/bmp-handbooks/new-development-redevelopment-bmp-handbook>.

Kennedy/Jenks Consultants, 2007. *The Truckee Meadows Industrial and Commercial Storm Water Best Management Practices Handbook*. Available online at: [http://www.cityofsparks.us/sites/default/files/assets/documents/env-control/construction/TM-I-C BMP Handbook 2-07-final.pdf](http://www.cityofsparks.us/sites/default/files/assets/documents/env-control/construction/TM-I-C_BMP_Handbook_2-07-final.pdf).

Orange County Stormwater Program, Best Management Practices for Industrial/Commercial Business Activities. Available online at: <http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessactivities>.

## **Parking Area Maintenance SC-43**

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Pollution from Surface Cleaning Folder, 1996, 2003. Bay Area Stormwater Management Agencies Association. Available online at:

<http://basmaa.org/Portals/0/documents/pdf/Pollution%20from%20Surface%20Cleaning.pdf>.

Sacramento Stormwater Management Program. *Best Management Practices for Industrial Storm Water Pollution Control*. Available online at:

<http://www.msa.saccounty.net/sactostormwater/documents/guides/industrial-BMP-manual.pdf>.

The Storm Water Managers Resource Center, <http://www.stormwatercenter.net>.

US EPA. *Post-Construction Stormwater Management in New Development and Redevelopment*. BMP Fact Sheets. Available online at:

[http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min\\_measure&min\\_measure\\_id=5](http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min_measure&min_measure_id=5).

# Drainage System Maintenance SC-44

## Description

As a consequence of its function, the stormwater drainage facilities on site convey stormwater that may contain certain pollutants either to the offsite conveyance system that collects and transports urban runoff and stormwater, or directly to receiving waters. The protocols in this fact sheet are intended to reduce pollutants leaving the site to the offsite drainage infrastructure or to receiving waters through proper on-site conveyance system operation and maintenance. The targeted constituents will vary depending on site characteristics and operations.

## Approach

Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

### General Pollution Prevention Protocols

- Maintain catch basins, stormwater inlets, and other stormwater conveyance structures on a regular basis to remove pollutants, reduce high pollutant concentrations during the first flush of storms, prevent clogging of the downstream conveyance system, restore catch basins' sediment trapping capacity, and ensure the system functions properly hydraulically to avoid flooding.
- Develop and follow a site specific drainage system maintenance plan that describes maintenance locations, methods, required equipment, water sources, sediment collection areas, disposal requirements, and any other pertinent information.



### Good Housekeeping

#### Illicit Connections and Discharges

- Look for evidence of illegal discharges or illicit connections during routine maintenance of conveyance system and drainage structures:

## Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize

## Targeted Constituents

Sediment	✓
Nutrients	✓
Trash	✓
Metals	✓
Bacteria	✓
Oil and Grease	✓
Organics	✓

## Minimum BMPs Covered

	Good Housekeeping	✓
	Preventative Maintenance	✓
	Spill and Leak Prevention and Response	✓
	Material Handling & Waste Management	
	Erosion and Sediment Controls	
	Employee Training Program	✓
	Quality Assurance Record Keeping	✓



## Drainage System Maintenance **SC-44**

- ✓ Identify evidence of spills such as paints, discoloring, odors, etc.
- ✓ Record locations of apparent illegal discharges/illicit connections.
- ✓ Track flows back to potential discharges and conduct aboveground inspections. This can be done through visual inspection of upgradient manholes or alternate techniques including zinc chloride smoke testing, fluorometric dye testing, physical inspection testing, or television camera inspection.
- ✓ Eliminate the discharge once the origin of flow is established.
- Stencil or demarcate storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as “Dump No Waste Drains to Stream” or similar stenciled next to them to warn against ignorant or intentional dumping of pollutants into the storm drainage system.
- Refer to fact sheet SC-10 Non-Stormwater Discharges for additional information.

### *Illegal Dumping*

- Inspect and clean up hot spots and other storm drainage areas regularly where illegal dumping and disposal occurs.
- Establish a system for tracking incidents. The system should be designed to identify the following:
  - ✓ Illegal dumping hot spots;
  - ✓ Types and quantities (in some cases) of wastes;
  - ✓ Patterns in time of occurrence (time of day/night, month, or year);
  - ✓ Mode of dumping (abandoned containers, “midnight dumping” from moving vehicles, direct dumping of materials, accidents/spills); and
  - ✓ Responsible parties.
- Post “No Dumping” signs in problem areas with a phone number for reporting dumping and disposal. Signs should also indicate fines and penalties for illegal dumping.
- Refer to fact sheet SC-10 Non-Stormwater Discharges for additional information.



### **Preventative Maintenance**

#### *Catch Basins/Inlet Structures*

- Staff should regularly inspect facilities to ensure compliance with the following:
  - ✓ Immediate repair of any deterioration threatening structural integrity.
  - ✓ Cleaning before the sump is 40% full. Catch basins should be cleaned as frequently as needed to meet this standard.

## **Drainage System Maintenance SC-44**

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- ❑ Clean catch basins, storm drain inlets, and other conveyance structures before the wet season to remove sediments and debris accumulated during the summer.
- ❑ Conduct inspections more frequently during the wet season for problem areas where sediment or trash accumulates more often. Prioritize storm drain inlets; clean and repair as needed.
- ❑ Keep accurate logs of the number of catch basins cleaned.
- ❑ Store wastes collected from cleaning activities of the drainage system in appropriate containers or temporary storage sites in a manner that prevents discharge to the storm drain.
- ❑ Dewater the wastes if necessary with outflow into the sanitary sewer if permitted. Water should be treated with an appropriate filtering device prior to discharge to the sanitary sewer. If discharge to the sanitary sewer is not allowed, water should be pumped or vacuumed to a tank and properly disposed. Do not dewater near a storm drain or stream.

### *Storm Drain Conveyance System*

- ❑ Locate reaches of storm drain with deposit problems and develop a flushing schedule that keeps the pipe clear of excessive buildup.
- ❑ Collect and pump flushed effluent to the sanitary sewer for treatment whenever possible.

### *Pump Stations*

- ❑ Clean all storm drain pump stations prior to the wet season to remove silt and trash.
- ❑ Do not allow discharge to reach the storm drain system when cleaning a storm drain pump station or other facility.
- ❑ Conduct routine maintenance at each pump station.
- ❑ Inspect, clean, and repair as necessary all outlet structures prior to the wet season.

### *Open Channel*

- ❑ Modify storm channel characteristics to improve channel hydraulics, increase pollutant removals, and enhance channel/creek aesthetic and habitat value.
- ❑ Conduct channel modification/improvement in accordance with existing laws. Any person, government agency, or public utility proposing an activity that will change the natural state of any river, stream, or lake in California, must enter into a Stream or Lake Alteration Agreement with the Department of Fish and Wildlife. The developer-applicant should also contact local governments (city, county, special districts), other state agencies (SWRCB, RWQCB, Department of Forestry, Department of Water Resources), and Army Corps of Engineers and USFWS.



### **Spill Response and Prevention Procedures**

- ❑ Keep your spill prevention control plan up-to-date.



## **Drainage System Maintenance SC-44**

- ☐ Investigate all reports of spills, leaks, and/or illegal dumping promptly.
- ☐ Place a stockpile of spill cleanup materials where it will be readily accessible or at a central location.
- ☐ Clean up all spills and leaks using “dry” methods (with absorbent materials and/or rags) or dig up, remove, and properly dispose of contaminated soil.



### ***Employee Training Program***

- ☐ Educate employees about pollution prevention measures and goals.
- ☐ Train employees how to properly handle and dispose of waste using the source control BMPs described above.
- ☐ Train employees and subcontractors in proper hazardous waste management.
- ☐ Use a training log or similar method to document training.
- ☐ Ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.
- ☐ Have staff involved in detection and removal of illicit connections trained in the following:
  - ✓ OSHA-required Health and Safety Training (29 CFR 1910.120) plus annual refresher training (as needed).
  - ✓ OSHA Confined Space Entry training (Cal-OSHA Confined Space, Title 8 and Federal OSHA 29 CFR 1910.146).
  - ✓ Procedural training (field screening, sampling, smoke/dye testing, TV inspection).



### ***Quality Assurance and Record Keeping***

- ☐ Keep accurate maintenance logs that document minimum BMP activities performed for drainage system maintenance, types and quantities of waste disposed of, and any improvement actions.
- ☐ Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.
- ☐ Keep accurate logs of illicit connections, illicit discharges, and illegal dumping into the storm drain system including how wastes were cleaned up and disposed.
- ☐ Establish procedures to complete logs and file them in the central office.

### **Potential Limitations and Work-Arounds**

Provided below are typical limitations and recommended “work-arounds” for drainage system maintenance:

## **Drainage System Maintenance SC-44**

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- Clean-up activities may create a slight disturbance for local aquatic species. Access to items and material on private property may be limited. Trade-offs may exist between channel hydraulics and water quality/riparian habitat. If storm channels or basins are recognized as wetlands, many activities, including maintenance, may be subject to regulation and permitting.
  - ✓ Perform all maintenance onsite and do not flush accumulated material downstream to private property or riparian habitats.
- Storm drain flushing is most effective in small diameter pipes (36-inch diameter pipe or less, depending on water supply and sediment collection capacity). Other considerations associated with storm drain flushing may include the availability of a water source, finding a downstream area to collect sediments, and liquid/sediment disposal.
  - ✓ Develop and follow a site specific drainage system maintenance plan that describes maintenance locations, methods, required equipment, water sources, sediment collection areas, disposal requirements, and any other pertinent information.
- Regulations may include adoption of substantial penalties for illegal dumping and disposal.
  - ✓ Do not dump illegal materials anywhere onsite.
  - ✓ Identify illicit connections, illicit discharge, and illegal dumping.
  - ✓ Cleanup spills immediately and properly dispose of wastes.
- Local municipal codes may include sections prohibiting discharge of soil, debris, refuse, hazardous wastes, and other pollutants into the sanitary sewer system.
  - ✓ Collect all materials and pollutants accumulated in drainage system and dispose of according to local regulations.
  - ✓ Install debris excluders in areas with a trash TMDL.

### **Potential Capital Facility Costs and Operation & Maintenance Requirements**

#### ***Facilities***

- Capital costs will vary substantially depending on the size of the facility and characteristics of the drainage system. Significant capital costs may be associated with purchasing water trucks, vacuum trucks, and any other necessary cleaning equipment or improving the drainage infrastructure to reduce the potential .
- Developing and implementing a site specific drainage system maintenance plan will require additional capital if a similar program is not already in place.

# Drainage System Maintenance SC-44

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## *Maintenance*

- Two-person teams may be required to clean catch basins with vacuor trucks.
- Teams of at least two people plus administrative personnel are required to identify illicit discharges, depending on the complexity of the storm sewer system.
- Arrangements must be made for proper disposal of collected wastes.
- Technical staff are required to detect and investigate illegal dumping violations.
- Methods used for illicit connection detection (smoke testing, dye testing, visual inspection, and flow monitoring) can be costly and time-consuming. Site-specific factors, such as the level of impervious area, the density and ages of buildings, and type of land use will determine the level of investigation necessary.

## **Supplemental Information**

### *Storm Drain Flushing*

Flushing is a common maintenance activity used to improve pipe hydraulics and to remove pollutants in storm drainage systems. Flushing may be designed to hydraulically convey accumulated material to strategic locations, such as an open channel, another point where flushing will be initiated, or the sanitary sewer and the treatment facilities, thus preventing re-suspension and overflow of a portion of the solids during storm events. Flushing prevents “plug flow” discharges of concentrated pollutant loadings and sediments. Deposits can hinder the designed conveyance capacity of the storm drain system and potentially cause backwater conditions in severe cases of clogging.

Storm drain flushing usually takes place along segments of pipe with grades that are too flat to maintain adequate velocity to keep particles in suspension. An upstream manhole is selected to place an inflatable device that temporarily plugs the pipe. Further upstream, water is pumped into the line to create a flushing wave. When the upstream reach of pipe is sufficiently full to cause a flushing wave, the inflated device is rapidly deflated with the assistance of a vacuum pump, thereby releasing the backed up water and resulting in the cleaning of the storm drain segment.

To further reduce impacts of stormwater pollution, a second inflatable device placed well downstream may be used to recollect the water after the force of the flushing wave has dissipated. A pump may then be used to transfer the water and accumulated material to the sanitary sewer for treatment. In some cases, an interceptor structure may be more practical or required to recollect the flushed waters.

It has been found that cleansing efficiency of periodic flush waves is dependent upon flush volume, flush discharge rate, sewer slope, sewer length, sewer flow rate, sewer diameter, and population density. As a rule of thumb, the length of line to be flushed should not exceed 700 feet. At this maximum recommended length, the percent removal efficiency ranges between 65-75% for organics and 55-65% for dry weather grit/inorganic material. The percent removal efficiency drops rapidly beyond that. Water is commonly supplied by a water truck, but fire hydrants can also supply water. To make the best use of water, it is recommended that reclaimed water be used if allowed or that fire hydrant line flushing coincide with storm sewer flushing.

# **Drainage System Maintenance SC-44**

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## **References and Resources**

City of Seattle, Seattle Public Utilities Department of Planning and Development, 2009. *Stormwater Manual Vol. 1 Source Control Technical Requirements Manual*.

Knox County Tennessee *Stormwater Management Manual* Chapter 5 Drainage System Maintenance, 2008. Available online at:  
[http://www.knoxcounty.org/stormwater/manual/Volume%201/knoxco\\_swmm\\_v1\\_chap5\\_jan2008.pdf](http://www.knoxcounty.org/stormwater/manual/Volume%201/knoxco_swmm_v1_chap5_jan2008.pdf).

US EPA. Storm Drain System Cleaning, 2012. Available online at:  
<http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=browse&Button=detail&bmp=102>.

# Infiltration Trench

# TC-10

## General Description

An infiltration trench is a gravel-filled trench that receives stormwater runoff. Runoff is stored in the void space between the stones and infiltrates through the bottom and sides of the trench into the soil matrix. Infiltration trenches promote stormwater infiltration, reduce discharge of stormwater to receiving waters and provide pollutant removal. Pretreatment using buffer strips, swales, or detention basins is important for limiting amounts of sediment, oil & grease, and trash and debris entering the trench which can clog and render the trench ineffective.

## Inspection/Maintenance Considerations

Frequency of clogging is dependent on effectiveness of pretreatment, such as vegetated buffer strips (see TC-31), vegetated swales (see TC-30), and detention basins (see TC-22) at removing sediments. Generally, clogging is occurring if the trench shows signs of long surface ponding. Clogging often occurs within the surface layer and removing and replacing the top 2-3 inches of the surface media may improve performance. If the clogging is subsurface, as determined by observing an inspection well, then completely removing the media and rehabbing the trench is needed. Clogged infiltration trenches with surface standing water can become a nuisance due to mosquito breeding. Maintenance efforts associated with infiltration trenches should include frequent inspections to ensure that water infiltrates into the subsurface completely at a recommended infiltration rate of 96 hours or less to prevent creating mosquito and other vector habitats.

## Advanced BMPs Covered



## Maintenance Concerns

- Accumulation of metals
- Clogged soil or outlet structures
- Vegetation/landscape maintenance

## Targeted Constituents

Sediment	■*
Nutrients	■
Trash	■*
Metals	■
Bacteria	■
Oil and Grease	■*
Organics	■

## Legend (Removal Effectiveness)

- Low ■ High ▲ Medium
- \* Requires Pretreatment

*Note: The removal effectiveness ratings shown in the table are for properly designed, sited, and maintained BMPs; some configurations will have variations in pollutant effectiveness.*





# Infiltration Trench

# TC-10

Inspection Activities	Suggested Frequency
<ul style="list-style-type: none"> <li>□ Inspect after major storms for the first few months to ensure proper functioning. Drain times should be observed to confirm that the designed drain time has been achieved.</li> <li>□ Inspect for upslope or adjacent contributing sediment sources and ensure that pretreatment systems are in place.</li> </ul>	After construction and semi-annually (beginning and end of rainy season)
<ul style="list-style-type: none"> <li>□ Inspect facility for signs of wetness or damage to structures, signs of petroleum hydrocarbon contamination, standing water, trash and debris, sediment accumulation, slope stability, standing water, and material buildup.</li> <li>□ Check for standing water or, if available, check observation wells following 3 days of dry weather to ensure proper drain time.</li> <li>□ Inspect pretreatment devices and diversion structures for damage, sediment buildup, and structural damage.</li> </ul>	Semi-annual and after major storm events
<ul style="list-style-type: none"> <li>□ Trenches with filter fabric should be inspected for sediment deposits by removing a small section of the top layer. If inspection indicates that the trench is partially or completely clogged, it should be restored to its design condition.</li> </ul>	Annual
Maintenance Activities	Suggested Frequency
<ul style="list-style-type: none"> <li>□ Repair undercut and eroded areas at inflow and outflow structures.</li> <li>□ Remove sediment, debris, and oil/grease from pretreatment devices, forebays, inlet/outlet structures, overflow spillway, and trenches as necessary.</li> </ul>	Standard maintenance (as needed)
<ul style="list-style-type: none"> <li>□ Remove trash, debris, grass clippings, trees, and other large vegetation from the trench perimeter and dispose of properly.</li> <li>□ Mow and trim vegetation to prevent establishment of woody vegetation, and for aesthetic and vector reasons.</li> </ul>	Semi-annual, more often as needed
<ul style="list-style-type: none"> <li>□ Remove accumulated sediment from the surface of the trench. Replace first layer of aggregate and filter fabric if clogging appears only to be at the surface.</li> <li>□ Clean trench when loss of infiltrative capacity is observed. If drawdown time is observed to have increased significantly over the design drawdown time, removal of sediment may be necessary. This is an expensive maintenance activity and the need for it can be minimized through prevention of upstream erosion.</li> </ul>	Annual
<ul style="list-style-type: none"> <li>□ Monitor ongoing effectiveness and determine if another BMP type or additional pretreatment could improve long-term performance. A qualified designer with knowledge of local soils and BMP design should be consulted in order to make this determination.</li> </ul>	Every 5 years

# Infiltration Trench

# TC-10

<ul style="list-style-type: none"> <li>❑ Total rehabilitation of the trench should be conducted to maintain storage capacity within 2/3 of the design treatment volume and 96-hour exfiltration rate limit.</li> <li>❑ Rehabilitation of the trench should be performed under the direction of a qualified designer with knowledge of local soils and BMP design. General steps for trench rehabilitation include:               <ul style="list-style-type: none"> <li>✓ Trench walls should be excavated to expose clean soil.</li> <li>✓ All of the stone aggregate must be removed. Filter fabric may need to be removed from the sides and bottom</li> <li>✓ Accumulated sediment should be stripped from the trench bottom. At this point the bottom may be scarified or tilled to help induce infiltration. New fabric and clean stone aggregate should be refilled.</li> </ul> </li> </ul>	<p>Upon reaching target thresholds</p>
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Most of the maintenance should be concentrated on the pretreatment practices, such as buffer strips and swales upstream of the trench to limit the amount of sediment that reaches the infiltration trench. Regular inspection should determine if the sediment removal structures require routine maintenance. Infiltration trenches should not be put into operation until the upstream tributary area is stabilized.

## Additional Information

Infiltration practices have historically had a high rate of failure compared to other stormwater management practices. One study conducted in Prince George's County, Maryland (Galli, 1992), revealed that less than half of the infiltration trenches investigated (of about 50) were still functioning properly, and less than one-third still functioned properly after 5 years. Many of these practices, however, did not incorporate advanced pretreatment. By carefully selecting the location and improving the design features of infiltration practices, their performance should improve.

It is absolutely critical that settleable particles and floatable materials be removed from runoff water before it enters the infiltration trench. The trench will clog and become nonfunctional if excessive particulate matter is allowed to enter the trench.

Special considerations are required for infiltration trenches to be effective in cold climates – refer to the Stormwater Managers Resource Center for more information.

## References

California Department of Transportation. *Treatment BMP Technology Report (CTSW-RT-09-239.06)*, 2010. Available online at: <http://www.dot.ca.gov/hq/env/stormwater/pdf/CTSW-RT-09-239-06.pdf>.

California Stormwater Quality Association. *Stormwater Best Management Practice Handbook, New Development and Redevelopment*, 2003. Available online at: <https://www.casqa.org/resources/bmp-handbooks/new-development-redevelopment-bmp-handbook>.

# Infiltration Trench

# TC-10

City of Los Angeles. “*Development Best Management Practices Handbook, Part B Planning Activities, 4<sup>th</sup> edition*, 2011. Available online at:  
[http://www.lastormwater.org/wp-content/files\\_mf/lidhandbookfinal62212.pdf](http://www.lastormwater.org/wp-content/files_mf/lidhandbookfinal62212.pdf).

Galli, J., 1992. *Analysis of Urban BMP Performance and Longevity in Prince George's County, Maryland*. Metropolitan Washington Council of Governments, Washington, D.C.

Minnesota Pollution Control Agency. Operation and Maintenance of Infiltration Trench, 2013. Available online at:  
[http://stormwater.pca.state.mn.us/index.php/Operation\\_and\\_maintenance\\_of\\_Infiltration\\_trench](http://stormwater.pca.state.mn.us/index.php/Operation_and_maintenance_of_Infiltration_trench).

Riverside County Flood Control and Water Conservation District. *Riverside County Design Handbook for Low Impact Development Best Management Practices*, 2011, Available online at:  
[http://rcflood.org/downloads/NPDES/Documents/LIDManual/LID\\_BMP\\_Design\\_Handbook.pdf](http://rcflood.org/downloads/NPDES/Documents/LIDManual/LID_BMP_Design_Handbook.pdf).

San Francisco Public Utilities Commission, et al. San Francisco Stormwater Design Guidelines. Appendix A, Stormwater BMP Fact Sheets, 2010. Available online at:  
<http://www.sfwater.org/modules/showdocument.aspx?documentid=2778>.

Stormwater Managers Resource Center. Available online at:  
<http://www.stormwatercenter.net>.

Stormwater Mangers Resource Center, Stormwater Practices for Cold Climates. Available online at: <http://www.stormwatercenter.net/Cold%20Climates/cold-climates.htm>.

Tahoe Regional Planning Agency. Best Management Practices Handbook, 2012.  
<http://www.tahoebmp.org/Documents/2012%20BMP%20Handbook.pdf>.

U.S. Environmental Protection Agency, Post-Construction Stormwater Management in New Development and Redevelopment, BMP Fact Sheets. Available online at:  
[http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min\\_measure&min\\_measure\\_id=5](http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min_measure&min_measure_id=5).

Ventura Countywide Stormwater Quality Management Program. *Technical Guidance Manual for Stormwater Quality Control Measures*, 2010. Available online at:  
[http://www.vcstormwater.org/documents/workproducts/technicalguidancemanual/2010revisions/Ventura%20Technical%20Guidance%20Document\\_5-6-10.pdf](http://www.vcstormwater.org/documents/workproducts/technicalguidancemanual/2010revisions/Ventura%20Technical%20Guidance%20Document_5-6-10.pdf).

Watershed Management Institute, Inc. *Operation, Maintenance, and Management of Stormwater Management Systems*. August, 1997. Available online at:  
<http://www.stormwater.ucf.edu/research/stormwaterOMM/stormwateromm.pdf>.

# Infiltration Basin

# TC-11

## General Description

An infiltration basin is a shallow impoundment that is designed to infiltrate stormwater. Infiltration basins store stormwater runoff until it gradually exfiltrates into the underlying soil. Pollutant removal occurs through the infiltration of runoff and the adsorption of pollutants into the soil and vegetation. Additional benefits include:

- Reduced runoff volume and attenuation of peak flows, and
- Facilitated groundwater recharge thus helping to maintain low flows in stream systems.

## Inspection/Maintenance Considerations

The use and regular maintenance of pretreatment BMPs will significantly minimize maintenance requirements for the basin. Installing vegetated swales or a sediment forebay upstream from the infiltration basin can provide effective pretreatment and reduce maintenance.

Spill response procedures and controls should be implemented to prevent spills from reaching the infiltration system. This BMP may require groundwater monitoring, and basins cannot be put into operation until the upstream tributary area is stabilized.

## Advanced BMPs Covered



## Maintenance Concerns

- *Vector Control*
- *Clogged soil or outlet structures*
- *Vegetation/Landscape Maintenance*
- *Groundwater contamination*
- *Accumulation of metals*
- *Aesthetics*

## Targeted Constituents

<i>Sediment</i>	■
<i>Nutrients</i>	■
<i>Trash</i>	■
<i>Metals</i>	■
<i>Bacteria</i>	■
<i>Oil and Grease</i>	■
<i>Organics</i>	■

## Legend (Removal Effectiveness)

- Low ▲ Medium ■ High
- ✱ Requires Pretreatment

*Note: The removal effectiveness ratings shown in the table are for properly designed, sited, and maintained BMPs; some configurations will have variations in pollutant effectiveness.*





# Infiltration Basin

# TC-11

Inspection Activities	Suggested Frequency
<input type="checkbox"/> Observe drain time for a storm after completion or modification of the facility to confirm that the desired drain time has been obtained. <input type="checkbox"/> Newly established vegetation should be inspected several times to determine if any landscape maintenance (reseeding, irrigation, etc.) is necessary. <input type="checkbox"/> Inspect for upslope or adjacent contributing sediment sources and ensure that pretreatment systems are in place.	Post construction and semi-annually (beginning and end of rainy season)
<input type="checkbox"/> Inspect for the following issues: differential accumulation of sediment, signs of wetness or damage to structures, erosion of the basin floor, dead or dying grass on the bottom, condition of riprap, drain time, signs of petroleum hydrocarbon contamination, standing water, trash and debris, sediment accumulation, slope stability, pretreatment device condition	Semi-annually and after extreme events
Maintenance Activities	Suggested Frequency
<input type="checkbox"/> Factors responsible for clogging should be repaired immediately.	Immediately
<input type="checkbox"/> Remove invasive weeds once monthly during the first two growing seasons.	Monthly during growing season
<input type="checkbox"/> Stabilize eroded banks with erosion control mat or mulch and revegetate. <input type="checkbox"/> Repair undercut and eroded areas at inflow and outflow structures. <input type="checkbox"/> Maintain access to the basin for regular maintenance activities. <input type="checkbox"/> Mow as appropriate for vegetative cover species. <input type="checkbox"/> Monitor health of vegetation and replace as necessary. <input type="checkbox"/> Control mosquitoes as necessary. <input type="checkbox"/> Remove litter and debris from infiltration basin area as required. <input type="checkbox"/> Trim vegetation to prevent establishment of woody vegetation that decreases storage volume.	Standard maintenance (as needed)
<input type="checkbox"/> Mow and remove grass clippings, litter, and debris. <input type="checkbox"/> Replant eroded or barren spots to prevent erosion and accumulation of sediment.	Semi-annual
<input type="checkbox"/> Scrape bottom and remove sediment when accumulated sediment reduces original infiltration rate by 25-50%. Restore original cross-section and infiltration rate. Properly dispose of sediment. <input type="checkbox"/> Seed or sod to restore ground cover. <input type="checkbox"/> Disc or otherwise aerate bottom. <input type="checkbox"/> Dethatch basin bottom.	3-5 year maintenance

If there are actual signs of clogging or significant loss of infiltrative capacity the following maintenance activities should be considered:

- ☐ Mechanically de-thatching and/or aerating the top soils along the sides and bottom of the basin.
- ☐ Tilling or dicing to scarify the bottom of the basin



# Infiltration Basin

# TC-11

These activities should be on an “as-needed” rather than on a routine basis. Always remove deposited sediments before scarification, and use a hand-guided rotary tiller, if possible, or a disc harrow pulled by a light tractor.

Clogged infiltration basins with surface standing water can become a breeding area for mosquitoes and midges. Maintenance efforts associated with infiltration basins should include frequent inspections to ensure that water infiltrates into the subsurface completely (recommended infiltration rate of 96 hours or less) and that vegetation is carefully managed to prevent creating mosquito and other vector habitats.

## Additional Information

In most cases, surface sediment removed from an infiltration basin during periodic maintenance to restore capacity does not contain toxic materials (e/g metals, oil and grease, or organics) at levels posing a hazardous concern. Studies to date indicate that pond sediments are generally below toxicity limits and can be safely landfilled or disposed onsite. Onsite sediment disposal is always preferable (if local authorities permit) as long as the sediments are deposited away from the perimeter to prevent their reentry into the basin. Sediments should be tested for toxic materials in compliance with current landfill requirements and disposed of properly.

Maintenance activities should use lightweight equipment (e.g. bobcat), which will not compact the underlying soil to remove the top layer of sediment. The remaining soil should be tilled and revegetated as soon as possible.

Sediment removal within the basin should be performed when the sediment is dry enough so that it is cracked and readily separates from the basin floor. This minimizes intermixing of the finer sediment with underlying coarser material on the basin floor.

Special maintenance considerations are required maintain infiltration basins effectiveness in cold climates. Treating runoff containing salt-based deicers in an infiltration basin may reduce soil fertility cause vegetation to fail. Incorporating mulch into the soil can help to mitigate this problem. Infiltration basins should not be used to store snow plowed from highways or parking lots. The sand in this snow can clog the basin. In addition, the chlorides and other pollutants can contaminate the groundwater.

## References

California Department of Transportation. *Treatment BMP Technology Report (CTSW-RT-09-239.06)*, 2010. Available online at: <http://www.dot.ca.gov/hq/env/stormwater/pdf/CTSW-RT-09-239-06.pdf>.

California Stormwater Quality Association. *Stormwater Best Management Practice Handbook, New Development and Redevelopment*, 2003. Available online at: <https://www.casqa.org/resources/bmp-handbooks/new-development-redevelopment-bmp-handbook>.

# Infiltration Basin

# TC-11

Riverside County Flood Control and Water Conservation District. *Riverside County Design Handbook for Low Impact Development Best Management Practices*, 2011.

Available online at:

[http://rcflood.org/downloads/NPDES/Documents/LIDManual/LID BMP Design Handbook.pdf](http://rcflood.org/downloads/NPDES/Documents/LIDManual/LID_BMP_Design_Handbook.pdf).

San Francisco Public Utilities Commission, et al. *San Francisco Stormwater Design Guidelines*. Appendix A, Stormwater BMP Fact Sheets, 2010. Available online at:

<http://www.sfwater.org/modules/showdocument.aspx?documentid=2778>.

Stormwater Managers Resource Center. <http://www.stormwatercenter.net>.

Stormwater Mangers Resource Center, Stormwater Practices for Cold Climates.

<http://www.stormwatercenter.net/Cold%20Climates/cold-climates.htm>.

Tahoe Regional Planning Agency. *Best Management Practices Handbook*, 2012.

Available online at:

<http://www.tahoebmp.org/Documents/2012%20BMP%20Handbook.pdf>.

U.S. Environmental Protection Agency, Post-Construction Stormwater Management in New Development and Redevelopment. BMP Fact Sheets. Available online

at: [http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min\\_measure&min\\_measure\\_id=5](http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min_measure&min_measure_id=5).

Ventura Countywide Stormwater Quality Management Program. *Technical Guidance Manual for Stormwater Quality Control Measures*, 2010. Available online

at: [http://www.vcstormwater.org/documents/workproducts/technicalguidancemanual/2010revisions/Ventura%20Technical%20Guidance%20Document\\_5-6-10.pdf](http://www.vcstormwater.org/documents/workproducts/technicalguidancemanual/2010revisions/Ventura%20Technical%20Guidance%20Document_5-6-10.pdf).

Watershed Management Institute, Inc. *Operation, Maintenance, and Management of Stormwater Management Systems*, 1997. Available online at:

<http://www.stormwater.ucf.edu/research/stormwaterOMM/stormwateromm.pdf>.

# Vegetated Swale

# TC-30

## General Description

Vegetated swales (also referred to as bioswales, biofiltration swales, or landscaped swales) are open, shallow channels with vegetation covering the side slopes and bottom that collect and slowly convey runoff flow to downstream discharge points. They are designed to treat runoff through filtering by the vegetation in the channel, filtering through a subsoil matrix, and/or infiltration into the underlying soils. Swales can be natural or manmade. They trap particulate pollutants (suspended solids and trace metals), promote infiltration, reduce flow velocity, and increase time of concentration of stormwater runoff. Vegetated swales can be implemented to provide effective pretreatment for detention and infiltration stormwater BMPs.

Vegetated swales can serve as part of a stormwater drainage system and can replace curbs, gutters and storm sewer systems. Therefore, swales are best suited for small landscaped portions of industrial or commercial facilities with low peak flow rates. They are not well suited to treat stormwater runoff from industrial areas that have insufficient source control BMPs.

## Inspection/Maintenance Considerations

A thick vegetative cover is needed for vegetated swales to function properly. Usually, swales require little more than normal landscape maintenance activities such as irrigation and mowing to maintain pollutant removal efficiency. Swales can become a nuisance due to mosquito breeding in standing water if obstructions develop (e.g., debris accumulation, invasive vegetation) and/or if proper drainage slopes are not implemented and maintained. The application of fertilizers and pesticides should be minimized.

## Advanced BMPs Covered



## Maintenance Concerns

- Channelization
- Vegetation/Landscape Maintenance
- Vector Control
- Aesthetics
- Flow Obstructions

## Targeted Constituents

Sediment	▲
Nutrients	●
Trash	●
Metals	▲
Bacteria	●
Oil and Grease	▲
Organics	▲

## Legend (Removal Effectiveness)

● Low ■ High ▲ Medium

\* Requires Pretreatment

*Note: The removal effectiveness ratings shown in the table are for properly designed, sited, and maintained BMPs; some configurations will have variations in pollutant effectiveness.*



# Vegetated Swale

# TC-30

Inspection Activities	Suggested Frequency
<input type="checkbox"/> Inspect after seeding and after first major storms for any damages.	Post construction
<input type="checkbox"/> Inspect for signs of erosion, damage to vegetation, channelization of flow, debris and litter, and areas of sediment accumulation. Perform inspections at the beginning and end of the wet season. Additional inspections after periods of heavy runoff are desirable.	Semi-annual
<input type="checkbox"/> Inspect level spreader for clogging, grass alongside slopes for erosion and formation of rills or gullies, and sand/soil bed for erosion problems.	Annual
Maintenance Activities	Suggested Frequency
<input type="checkbox"/> Mow grass to maintain a height of 3–4 inches, for safety, aesthetic, or other purposes. Litter should always be removed prior to mowing. Clippings should be composted. <input type="checkbox"/> Irrigate swale during dry season (April through October) or when necessary to maintain the vegetation. <input type="checkbox"/> Provide weed control, if necessary to control invasive species.	As needed (frequent, seasonally)
<input type="checkbox"/> Remove litter, branches, rocks blockages, and other debris and dispose of properly. <input type="checkbox"/> Maintain inlet flow spreader (if applicable). <input type="checkbox"/> Repair any damaged areas within a channel identified during inspections. Erosion rills or gullies should be corrected as needed. Bare areas should be replanted as necessary.	Semi-annual
<input type="checkbox"/> Declog the pea gravel diaphragm, if necessary. <input type="checkbox"/> Correct erosion problems in the sand/soil bed of dry swales. <input type="checkbox"/> Plant an alternative grass species if the original grass cover has not been successfully established. Reseed and apply mulch to damaged areas.	Annual (as needed)
<input type="checkbox"/> Remove all accumulated sediment that may obstruct flow through the swale. Sediment accumulating near culverts and in channels should be removed when it builds up to 3 in. at any spot, or covers vegetation, or once it has accumulated to 10% of the original design volume. Replace the grass areas damaged in the process. <input type="checkbox"/> Rototill or cultivate the surface of the sand/soil bed of dry swales if the swale does not draw down within 48 hours.	As needed (infrequent)



# Vegetated Swale

# TC-30

## Additional Information

Research (Colwell et al., 2000) indicates that grass height and mowing frequency have little impact on pollutant removal. Consequently, mowing may only be necessary once or twice a year for safety or aesthetics or to suppress weeds and woody vegetation.

The swale bottom and side slopes should be covered with dense vegetative cover to filter pollutants out of runoff and helps reduce flow velocities and protect the swale from erosion. Fine, close-growing grasses are ideal because increasing the surface area of the vegetation exposed to runoff improves the effectiveness of the swale. Drought tolerant vegetation than can tolerate sediment and debris accumulations are best-suited for swales.

## References

California Department of Transportation. *Treatment BMP Technology Report (CTSW-RT-09-239.06)*, 2010. Available online at:

<http://www.dot.ca.gov/hq/env/stormwater/pdf/CTSW-RT-09-239-06.pdf>.

California Stormwater Quality Association. *Stormwater Best Management Practice Handbook, New Development and Redevelopment*, 2003. Available online at:

<https://www.casqa.org/resources/bmp-handbooks/new-development-redevelopment-bmp-handbook>.

Colwell, Shanti R., Horner, Richard R., and Booth, Derek B., 2000. *Characterization of Performance Predictors and Evaluation of Mowing Practices in Biofiltration Swales*. Report to King County Land and Water Resources Division and others by Center for Urban Water Resources Management, Department of Civil and Environmental Engineering, University of Washington, Seattle.

San Francisco Public Utilities Commission, et al. *San Francisco Stormwater Design Guidelines*. Appendix A, Stormwater BMP Fact Sheets, 2010. Available online at:

<http://www.sfwater.org/modules/showdocument.aspx?documentid=2778>.

Stormwater Managers Resource Center. <http://www.stormwatercenter.net>.

Stormwater Mangers Resource Center, Stormwater Practices for Cold Climates.

<http://www.stormwatercenter.net/Cold%20Climates/cold-climates.htm>.

Tahoe Regional Planning Agency. *Best Management Practices Handbook*, 2012.

Available online at:

<http://www.tahoebmp.org/Documents/2012%20BMP%20Handbook.pdf>.

U.S. Environmental Protection Agency, Post-Construction Stormwater Management in New Development and Redevelopment. BMP Fact Sheets. Available online at:

[http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min\\_measure&min\\_measure\\_id=5](http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min_measure&min_measure_id=5).



# Vegetated Swale

TC-30

Ventura Countywide Stormwater Quality Management Program. *Technical Guidance Manual for Stormwater Quality Control Measures*, 2010. Available online at: [http://www.vcstormwater.org/documents/workproducts/technicalguidancemanual/2010revisions/Ventura%20Technical%20Guidance%20Document\\_5-6-10.pdf](http://www.vcstormwater.org/documents/workproducts/technicalguidancemanual/2010revisions/Ventura%20Technical%20Guidance%20Document_5-6-10.pdf).

Watershed Management Institute, Inc. *Operation, Maintenance, and Management of Stormwater Management Systems*, 1997. Available online at: <http://www.stormwater.ucf.edu/research/stormwaterOMM/stormwateromm.pdf>.

# Vegetated Buffer Strip

# TC-31

## General Description

Vegetated buffer strips (vegetated filter strips, biostrips, filter strips, and grassed filters) are vegetated surfaces that are designed to treat sheet flow from adjacent surfaces. They are an effective, easy to implement BMP that often go unrecognized at industrial and commercial facilities.

Vegetated buffer strips function by slowing runoff velocities and allowing sediment and other pollutants to settle and by providing some infiltration into underlying soils. They are well-suited to treating runoff from roads, roof downspouts, small parking lots, and pervious surfaces. They can be implemented to provide effective pretreatment for detention and infiltration stormwater BMPs.

Vegetated buffer strips can serve as part of a stormwater drainage system and can replace curbs, gutters and storm sewer systems. Therefore, they are best suited for small landscaped portions of industrial or commercial facilities with low peak flow rates. They are not well suited to treat stormwater runoff from industrial areas that have insufficient source control BMPs.

## Inspection/Maintenance Considerations

Vegetated buffer strips require frequent landscape maintenance. In many cases, vegetated buffer strips initially require intense maintenance, but less maintenance is needed over time. Maintenance tasks may be conducted by a landscaping contractor. Maintenance requirements typically include grass or shrub-growing activities such as irrigation, mowing, trimming, removal of invasive species, and replanting when necessary. Buffer strips require more attention as the volume of sediment increases. Vegetated buffer strips can become a nuisance due to mosquito breeding in level spreaders (unless

## Advanced BMPs Covered



## Maintenance Concerns

- *Vector Control*
- *Invasive Species Management*
- *Vegetation/Landscape Maintenance*
- *Erosion*
- *Channelization of Flow*
- *Aesthetics*

## Targeted Constituents

<i>Sediment</i>	■
<i>Nutrients</i>	●
<i>Trash</i>	▲
<i>Metals</i>	■
<i>Bacteria</i>	●
<i>Oil and Grease</i>	■
<i>Organics</i>	▲

## Legend (Removal Effectiveness)

● Low ■ High ▲ Medium

\* Requires Pretreatment

*Note: The removal effectiveness ratings shown in the table are for properly designed, sited, and maintained BMPs; some configurations will have variations in pollutant effectiveness.*



# Vegetated Buffer Strip

## TC-31

designed to dewater completely in 96 hours or less) and/or if proper drainage slopes are not maintained.

Inspection Activities	Suggested Frequency
<input type="checkbox"/> Once the vegetated buffer strip is established, inspect at least three times per year. Repair all damage immediately. <input type="checkbox"/> Inspect buffer strips after seeding and repair as needed.	Post construction
<input type="checkbox"/> Inspect buffer strip and repair all damage immediately. <input type="checkbox"/> Inspect soil and repair eroded areas.	After major storms
<input type="checkbox"/> Inspect for erosion or damage to vegetation, preferably at the end of the wet season to schedule summer maintenance and before major fall runoff to be sure the strips are ready for winter. However, additional inspection after periods of heavy runoff is desirable. <input type="checkbox"/> Inspect pea-gravel diaphragm/level spreader for clogging and effectiveness and remove built-up sediment. <input type="checkbox"/> Inspect for rolls and gullies. Immediately fill with topsoil, install erosion control blanket and seed or sod. <input type="checkbox"/> Inspect to ensure vegetation is well established. If not, either prepare soil and reseed or replace with alternative species. Install erosion control blanket. <input type="checkbox"/> Check for debris and litter, and areas of sediment accumulation.	Semi-annual
Maintenance Activities	Suggested Frequency
<input type="checkbox"/> Water plants daily for 2 weeks after construction.	Post construction
<input type="checkbox"/> Mow regularly to maintain vegetation height between 2 - 4 inches, and to promote thick, dense vegetative growth. Cut only when soil is dry to prevent tracking damage to vegetation, soil compaction and flow concentrations. Clippings are to be removed immediately after mowing. <input type="checkbox"/> Remove all litter, branches, rocks, or other debris. Damaged areas of the filter strip should be repaired immediately by reseeding and applying mulch. <input type="checkbox"/> Regularly maintain inlet flow spreader. <input type="checkbox"/> Irrigate during dry season (April through October) when necessary to maintain the vegetation.	Frequently, as needed
<input type="checkbox"/> Remulch void areas. <input type="checkbox"/> Treat diseased trees and shrubs, remove dead vegetation.	Semi-annual
<input type="checkbox"/> Remove sediment and replant in areas of buildup. Sediment accumulating near culverts and in channels should be removed when it builds up to 3 in. at any spot, or covers vegetation. <input type="checkbox"/> Limit fertilizer applications based on plant vigor and soil test results. <input type="checkbox"/> Rework or replant buffer strip if concentrated flow erodes a channel through the strip.	Annual

# Vegetated Buffer Strip

# TC-31

## Additional Information

Research (Colwell et al., 2000) indicates that grass height and mowing frequency have little impact on pollutant removal. Consequently, mowing may only be necessary once or twice a year for safety or aesthetics or to suppress weeds and woody vegetation.

Trash tends to accumulate in swale areas, particularly along highways. The need for litter removal is determined through periodic inspection, but litter should always be removed prior to mowing.

The buffer strip should be covered with dense vegetative cover to filter pollutants out of runoff and helps reduce flow velocities and protect the strip from erosion. Fine, close-growing grasses are ideal because increasing the surface area of the vegetation exposed to runoff improves the effectiveness of the swale. Drought tolerant vegetation that can tolerate sediment and debris accumulations is best-suited for vegetated buffer strips.

## References

California Department of Transportation. *Treatment BMP Technology Report (CTSW-RT-09-239.06)*. April, 2010. Available online at:  
<http://www.dot.ca.gov/hq/env/stormwater/pdf/CTSW-RT-09-239-06.pdf>.

California Stormwater Quality Association. *Stormwater Best Management Practice Handbook, New Development and Redevelopment*, 2003. Available online at:  
<https://www.casqa.org/resources/bmp-handbooks/new-development-redevelopment-bmp-handbook>.

California Stormwater Quality Association. *Stormwater Best Management Practice Handbook, New Development and Redevelopment*, 2003. Available online at:  
<https://www.casqa.org/resources/bmp-handbooks/new-development-redevelopment-bmp-handbook>.

Colwell, Shanti R., Horner, Richard R., and Booth, Derek B. *Characterization of Performance Predictors and Evaluation of Mowing Practices in Biofiltration Swales*. Report to King County Land and Water Resources Division and others by Center for Urban Water Resources Management, Department of Civil and Environmental Engineering, University of Washington, Seattle, 2000.

San Francisco Public Utilities Commission, et al. *San Francisco Stormwater Design Guidelines*. Appendix A, Stormwater BMP Fact Sheets, 2010. Available online at:  
<http://www.sfwater.org/modules/showdocument.aspx?documentid=2778>.

Stormwater Managers Resource Center. <http://www.stormwatercenter.net>.

Tahoe Regional Planning Agency. *Best Management Practices Handbook*, 2012. Available online at:  
<http://www.tahoebmp.org/Documents/2012%20BMP%20Handbook.pdf>.

## **Vegetated Buffer Strip**

**TC-31**

U.S. Environmental Protection Agency, Post-Construction Stormwater Management in New Development and Redevelopment. BMP Fact Sheets. Available online at: [http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min\\_measure&min\\_measure\\_id=5](http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min_measure&min_measure_id=5).

Ventura Countywide Stormwater Quality Management Program. *Technical Guidance Manual for Stormwater Quality Control Measures*, 2010. Available online at: [http://www.vcstormwater.org/documents/workproducts/technicalguidancemanual/2010revisions/Ventura%20Technical%20Guidance%20Document\\_5-6-10.pdf](http://www.vcstormwater.org/documents/workproducts/technicalguidancemanual/2010revisions/Ventura%20Technical%20Guidance%20Document_5-6-10.pdf).

Watershed Management Institute, Inc. *Operation, Maintenance, and Management of Stormwater Management Systems*. August, 1997. Available online at: <http://www.stormwater.ucf.edu/research/stormwaterOMM/stormwateromm.pdf>.



# Non-Stormwater Discharges SC-10

## Description

Non-stormwater discharges (NSWDs) are flows that do not consist entirely of stormwater. Some non-stormwater discharges do not include pollutants and may be discharged to the storm drain if local regulations allow. These include uncontaminated groundwater and natural springs. There are also some non-stormwater discharges that typically do not contain pollutants and may be discharged to the storm drain with conditions. These include: potable water sources, fire hydrant flushing, air conditioner condensate, landscape irrigation drainage and landscape watering, emergency firefighting, etc. as discussed in Section 2.

However there are certain non-stormwater discharges that pose an environmental concern. These discharges may originate from illegal dumping of industrial material or wastes and illegal connections such as internal floor drains, appliances, industrial processes, sinks, and toilets that are illegally connected to the nearby storm drainage system through on-site drainage and piping. These unauthorized discharges (examples of which may include: process waste waters, cooling waters, wash waters, and sanitary wastewater) can carry substances such as paint, oil, fuel and other automotive fluids, chemicals and other pollutants into storm drains.

Non-stormwater discharges will need to be addressed through a combination of detection and elimination. The ultimate goal is to effectively eliminate unauthorized non-stormwater discharges to the stormwater drainage system through implementation of measures to detect, correct, and enforce against illicit connections and illegal discharges of

## Objectives

- *Cover*
- *Contain*
- *Educate*
- *Reduce/Minimize*
- *Product Substitution*

## Targeted Constituents

<i>Sediment</i>	
<i>Nutrients</i>	✓
<i>Trash</i>	
<i>Metals</i>	✓
<i>Bacteria</i>	✓
<i>Oil and Grease</i>	✓
<i>Organics</i>	✓

## Minimum BMPs Covered

	<i>Good Housekeeping</i>	✓
	<i>Preventative Maintenance</i>	
	<i>Spill and Leak Prevention and Response</i>	✓
	<i>Material Handling &amp; Waste Management</i>	
	<i>Erosion and Sediment Controls</i>	
	<i>Employee Training Program</i>	✓
	<i>Quality Assurance Record Keeping</i>	✓



# Non-Stormwater Discharges SC-10

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pollutants on streets and into the storm drain system and downstream water bodies.

## Approach

Initially the Discharger must make an assessment of non-stormwater discharges to determine which types must be eliminated or addressed through BMPs. The focus of the following approach is the elimination of unauthorized non-stormwater discharges. See other BMP Fact Sheets for activity-specific pollution prevention procedures.

### *General Pollution Prevention Protocols*

- ❑ Implement waste management controls described in SC-34 Waste Handling and Disposal.
- ❑ Develop clear protocols and lines of communication for effectively prohibiting non-stormwater discharges, especially those that are not classified as hazardous. These are often not responded to as effectively as they need to be.
- ❑ Stencil or demarcate storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as “Dump No Waste Drains to Stream” or similar stenciled or demarcated next to them to warn against ignorant or unintentional dumping of pollutants into the storm drainage system.
- ❑ Manage and control sources of water such as hose bibs, faucets, wash racks, irrigation heads, etc. Identify hoses and faucets in the SWPPP, and post signage for appropriate use.

### *Non-Stormwater Discharge Investigation Protocols*

Identifying the sources of non-stormwater discharges requires the Discharger to conduct an investigation of the facility at regular intervals. There are several categories of non-stormwater discharges:

- ❑ Visible, easily identifiable discharges, typically generated as surface runoff, such as uncontained surface runoff from vehicle or equipment washing; and
- ❑ Non-visible, (e.g., subsurface) discharges into the site drainage system through a variety of pathways that are not obvious.

The approach to detecting and eliminating non-stormwater discharges will vary considerably, as discussed below:

### *Visible and identifiable discharges*

- ❑ Conduct routine inspections of the facilities and of each major activity area and identify visible evidence of unauthorized non-stormwater discharges. This may include:
  - ✓ Visual observations of actual discharges occurring;

# Non-Stormwater Discharges SC-10

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- ✓ Evidence of surface staining, discoloring etc. that indicates that discharges have occurred;
  - ✓ Pools of water in low lying areas when a rain event has not occurred; and
  - ✓ Discussions with operations personnel to understand practices that may lead to unauthorized discharges.
- If evidence of non-stormwater discharges is discovered:
- ✓ Document the location and circumstances using Worksheets 5 and 6 (Section 2 of the manual), including digital photos;
  - ✓ Identify and implement any quick remedy or corrective action (e.g., moving uncovered containers inside or to a proper location); and
  - ✓ Develop a plan to eliminate the discharge. Consult the appropriate activity-specific BMP Fact Sheet for alternative approaches to manage and eliminate the discharge.
- Consult the appropriate activity-specific BMP Fact Sheet for alternative approaches to manage and eliminate the discharge. Make sure the facility SWPPP is up-to-date and includes applicable BMPs to address the non-stormwater discharge.

## ***Other Illegal Discharges (Non visible)***

### *Illicit Connections*

- Locate discharges from the industrial storm drainage system to the municipal storm drain system through review of “as-built” piping schematics.
- Isolate problem areas and plug illicit discharge points.
- Locate and evaluate discharges to the storm drain system.
- Visual Inspection and Inventory:
  - ✓ Inventory and inspect each discharge point during dry weather.
  - ✓ Keep in mind that drainage from a storm event can continue for a day or two following the end of a storm and groundwater may infiltrate the underground stormwater collection system.
  - ✓ Non-stormwater discharges are often intermittent and may require periodic inspections.

### *Review Infield Piping*

- A review of the “as-built” piping schematic is a way to determine if there are any connections to the stormwater collection system.

## Non-Stormwater Discharges **SC-10**

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- ❑ Inspect the path of loading/unloading area drain inlets and floor drains in older buildings.
- ❑ Never assume storm drains are connected to the sanitary sewer system.

### *Monitoring for investigation/detection of illegal discharges*

- ❑ If a suspected illegal or unknown discharge is detected, monitoring of the discharge may help identify the content and/or suggest the source. This may be done with a field screening analysis, flow meter measurements, or by collecting a sample for laboratory analysis. Section 5 and Appendix D describe the necessary field equipment and procedures for field investigations.
- ❑ Investigative monitoring may be conducted over time. For example if, a discharge is intermittent, then monitoring might be conducted to determine the timing of the discharge to determine the source.
- ❑ Investigative monitoring may be conducted over a spatial area. For example, if a discharge is observed in a pipe, then monitoring might be conducted at accessible upstream locations in order to pinpoint the source of the discharge.
- ❑ Generally, investigative monitoring requiring collection of samples and submittal for lab analysis requires proper planning and specially trained staff.

### *Smoke Testing*

Smoke testing of wastewater and stormwater collection systems is used to detect connections between the two piping systems. Smoke testing is generally performed at a downstream location and the smoke is forced upstream using blowers to create positive pressure. The advantage to smoke testing is that it can potentially identify multiple potential discharge sources at once.

- ❑ Smoke testing uses a harmless, non-toxic smoke cartridges developed specifically for this purpose.
- ❑ Smoke testing requires specialized equipment (e.g., cartridges, blowers) and is generally only appropriate for specially trained staff.
- ❑ A Standard Operating Procedure (SOP) for smoke testing is highly desirable. The SOP should address the following elements:
  - ✓ Proper planning and notification of nearby residents and emergency services is necessary since introducing smoke into the system may result in false alarms;
  - ✓ During dry weather, the stormwater collection system is filled with smoke and then traced back to sources;

## Non-Stormwater Discharges **SC-10**

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- ✓ Temporary isolation of segments of pipe using sand bags is often needed to force the smoke into leaking pipes; and
- ✓ The appearance of smoke in a waste vent pipe, at a sewer manhole, or even the base of a toilet indicates that there may be a connection between the sanitary and storm water systems.
- Most municipal wastewater agencies will have necessary staff and equipment to conduct smoke testing and they should be contacted if cross connections with the sanitary sewer are suspected. See SC-44 Drainage System Maintenance for more information.

### *Dye Testing*

- Dye testing is typically performed when there is a suspected specific pollutant source and location (i.e., leaking sanitary sewer) and there is evidence of dry weather flows in the stormwater collection system.
- Dye is released at a probable upstream source location, either the facility's sanitary or process wastewater system. The dye must be released with a sufficient volume of water to flush the system.
- Operators then visually examine the downstream discharge points from the stormwater collection system for the presence of the dye.
- Dye testing can be performed informally using commercially available products in order to conduct an initial investigation for fairly obvious cross-connections.
- More detailed dye testing should be performed by properly trained staff and follow SOPs. Specialized equipment such as fluorometers may be necessary to detect low concentrations of dye.
- Most municipal wastewater agencies will have necessary staff and equipment to conduct dye testing and they should be contacted if cross connections with the sanitary sewer are suspected.

### *TV Inspection of Drainage System*

- Closed Circuit Television (CCTV) can be employed to visually identify illicit connections to the industrial storm drainage system. Two types of CCTV systems are available: (1) a small specially designed camera that can be manually pushed on a stiff cable through storm drains to observe the interior of the piping, or (2) a larger remote operated video camera on treads or wheels that can be guided through storm drains to view the interior of the pipe.
- CCTV systems often include a high-pressure water jet and camera on a flexible cable. The water jet cleans debris and biofilm off the inside of pipes so the camera can take video images of the pipe condition.



## Non-Stormwater Discharges SC-10

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- ❑ CCTV units can detect large cracks and other defects such as offsets in pipe ends caused by root intrusions or shifting substrate.
- ❑ CCTV can also be used to detect dye introduced into the sanitary sewer.
- ❑ CCTV inspections require specialized equipment and properly trained staff and are generally best left to specialized contractors or municipal public works staff.

### ***Illegal Dumping***

- ❑ Substances illegally dumped on streets and into the storm drain systems and creeks may include paints, used oil and other automotive fluids, construction debris, chemicals, fresh concrete, leaves, grass clippings, and pet wastes. These wastes can cause stormwater and receiving water quality problems as well as clog the storm drain system itself.
- ❑ Establish a system for tracking incidents. The system should be designed to identify the following:
  - ✓ Illegal dumping hot spots;
  - ✓ Types and quantities (in some cases) of wastes;
  - ✓ Patterns in time of occurrence (time of day/night, month, or year);
  - ✓ Mode of dumping (abandoned containers, “midnight dumping” from moving vehicles, direct dumping of materials, accidents/spills);
  - ✓ An anonymous tip/reporting mechanism; and
  - ✓ Evidence of responsible parties (e.g., tagging, encampments, etc.).
- ❑ One of the keys to success of reducing or eliminating illegal dumping is increasing the number of people at the facility who are aware of the problem and who have the tools to at least identify the incident, if not correct it. Therefore, train field staff to recognize and report the incidents.

Once a site has been cleaned:

- ❑ Post “No Dumping” signs with a phone number for reporting dumping and disposal.
- ❑ Landscaping and beautification efforts of hot spots may also discourage future dumping, as well as provide open space and increase property values.
- ❑ Lighting or barriers may also be needed to discourage future dumping.
- ❑ See fact sheet SC-11 Spill Prevention, Control, and Cleanup.

# Non-Stormwater Discharges **SC-10**

## *Inspection*

- ❑ Regularly inspect and clean up hot spots and other storm drainage areas where illegal dumping and disposal occurs.
- ❑ Conduct field investigations of the industrial storm drain system for potential sources of non-stormwater discharges.
- ❑ Pro-actively conduct investigations of high priority areas. Based on historical data, prioritize specific geographic areas and/or incident type for pro-active investigations.



## **Spill and Leak Prevention and Response**

- ❑ On paved surfaces, clean up spills with as little water as possible. Use a rag for small spills, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to a certified laundry (rags) or disposed of as hazardous waste.
- ❑ Never hose down or bury dry material spills. Sweep up the material and dispose of properly.
- ❑ Use adsorbent materials on small spills rather than hosing down the spill. Remove the adsorbent materials promptly and dispose of properly.
- ❑ For larger spills, a private spill cleanup company or Hazmat team may be necessary.
- ❑ See SC-11 Spill Prevention Control and Cleanup.



## **Employee Training Program**

- ❑ Training of technical staff in identifying and documenting illegal dumping incidents is required. The frequency of training must be presented in the SWPPP, and depends on site-specific industrial materials and activities.
- ❑ Consider posting a quick reference table near storm drains to reinforce training.
- ❑ Train employees to identify non-stormwater discharges and report discharges to the appropriate departments.
- ❑ Educate employees about spill prevention and cleanup.
- ❑ Well-trained employees can reduce human errors that lead to accidental releases or spills. The employee should have the tools and knowledge to immediately begin cleaning up a spill should one occur. Employees should be familiar with the Spill Prevention Control and Countermeasure Plan. Employees should be able to identify work/jobs with high potential for spills and suggest methods to reduce possibility.
- ❑ Determine and implement appropriate outreach efforts to reduce non-permissible non-stormwater discharges.

# Non-Stormwater Discharges SC-10

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- ☐ Conduct spill response drills annually (if no events occurred) in order to evaluate the effectiveness of the plan.
- ☐ When a responsible party is identified, educate the party on the impacts of his or her actions.



## **Quality Assurance and Record Keeping**

### *Performance Evaluation*

- ☐ Annually review internal investigation results; assess whether goals were met and what changes or improvements are necessary.
- ☐ Obtain feedback from personnel assigned to respond to, or inspect for, illicit connections and illegal dumping incidents.
- ☐ Develop document and data management procedures.
- ☐ A database is useful for defining and tracking the magnitude and location of the problem.
- ☐ Report prohibited non-stormwater discharges observed during the course of normal daily activities so they can be investigated, contained, and cleaned up or eliminated.
- ☐ Document that non-stormwater discharges have been eliminated by recording tests performed, methods used, dates of testing, and any on-site drainage points observed.
- ☐ Annually document and report the results of the program.
- ☐ Maintain documentation of illicit connection and illegal dumping incidents, including significant conditionally exempt discharges that are not properly managed.
- ☐ Document training activities.

## **Potential Limitations and Work-Arounds**

Some facilities may have space constraints, limited staffing and time limitations that may preclude implementation of BMPs. Provided below are typical limitations and recommended “work-arounds.”

- ☐ Many facilities do not have accurate, up-to-date ‘as-built’ plans or drawings which may be necessary in order to conduct non-stormwater discharge assessments.
  - ✓ Online tools such as Google Earth™ can provide an aerial view of the facility and may be useful in understanding drainage patterns and potential sources of non-stormwater discharges
  - ✓ Local municipal jurisdictions may have useful drainage systems maps.

## Non-Stormwater Discharges SC-10

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- ❑ Video surveillance cameras are commonly used to secure the perimeter of industrial facilities against break-ins and theft. These surveillance systems may also be useful for capturing illegal dumping activities. Minor, temporary adjustments to the field of view of existing surveillance camera systems to target known or suspected problem areas may be a cost-effective way of capturing illegal dumping activities and identifying the perpetrators.

### Potential Capital Facility Costs and Operation & Maintenance Requirements

#### *Facilities*

- ❑ Capital facility cost requirements may be minimal unless cross-connections to storm drains are detected.
- ❑ Indoor floor drains may require re-plumbing if cross-connections are detected.
- ❑ Leaky sanitary sewers will require repair or replacement which can have significant costs depending on the size and industrial activity at the facility.

#### *Maintenance (including administrative and staffing)*

- ❑ The primary effort is for staff time and depends on how aggressively a program is implemented.
- ❑ Costs for containment, and disposal of any leak or discharge is borne by the Discharger.
- ❑ Illicit connections can be difficult to locate especially if there is groundwater infiltration.
- ❑ Illegal dumping and illicit connection violations requires technical staff to detect and investigate them.

### Supplemental Information

#### *Permit Requirements*

The IGP authorizes certain Non-Storm Water Discharges (NSWDs) provided BMPs are included in the SWPPP and implemented to:

- ❑ Reduce or prevent the contact of authorized NSWDs with materials or equipment that are potential sources of pollutants;
- ❑ Reduce, to the extent practicable, the flow or volume of authorized NSWDs;
- ❑ Ensure that authorized NSWDs do not contain quantities of pollutants that cause or contribute to an exceedance of a water quality standards (WQS); and,

## Non-Stormwater Discharges SC-10

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- ❑ Reduce or prevent discharges of pollutants in authorized NSWs in a manner that reflects best industry practice considering technological availability and economic practicability and achievability.”

### References and Resources

Center for Watershed Protection, 2004. *Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments*, EPA Cooperative Agreement X-82907801-0.

Dublin San Ramon Sanitation District. <http://www.dsrsd.com/wwwr/smoketest.html>.

Orange County Stormwater Program, Best Management Practices for Industrial/Commercial Business Activities. Available online at: <http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessesactivities>.

Sacramento Stormwater Management Program, *Best Management Practices for Industrial Storm Water Pollution Control*, Available online at: <http://www.msa.saccounty.net/sactostormwater/documents/guides/industrial-BMP-manual.pdf>.

Santa Clara Valley Urban Runoff Pollution Prevention Program. <http://www.scvurppp.org>.

Southern California Coastal Water Research Project, 2013. *The California Microbial Source Identification Manual: A Tiered Approach to Identifying Fecal Pollution Sources to Beaches*, Technical Report 804.

The Storm Water Managers Resource Center, <http://www.stormwatercenter.net/>.

US EPA. National Pollutant Discharge Elimination System. Available online at: [http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=factsheet\\_results&view=specific&bmp=111](http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=factsheet_results&view=specific&bmp=111).

WEF Press Alexandria, Virginia, 2009. Existing Sewer Evaluation and Rehabilitation: *WEF Manual of Practice No. FD-6 ASCE/EWRI Manuals and Reports on Engineering Practice No. 62, Third Edition*.



# Spill Prevention, Control & Cleanup SC-11

## Description

Many activities that occur at an industrial or commercial site have the potential to cause accidental spills. Preparation for accidental spills, with proper training and reporting systems implemented, can minimize the discharge of pollutants to the environment.

Spills and leaks are one of the largest contributors of stormwater pollutants. Spill prevention and control plans are applicable to any site at which hazardous materials are stored or used. An effective plan should have spill prevention and response procedures that identify hazardous material storage areas, specify material handling procedures, describe spill response procedures, and provide locations of spill clean-up equipment and materials. The plan should take steps to identify and characterize potential spills, eliminate and reduce spill potential, respond to spills when they occur in an effort to prevent pollutants from entering the stormwater drainage system, and train personnel to prevent and control future spills. An adequate supply of spill clean-up materials must be maintained onsite.

## Approach

### General Pollution Prevention Protocols

- ☐ Develop procedures to prevent/mitigate spills to storm drain systems.
- ☐ Develop and standardize reporting procedures, containment, storage, and disposal activities, documentation, and follow-up procedures.
- ☐ Establish procedures and/or controls to minimize spills and leaks. The procedures should address:
  - ✓ Description of the facility, owner and address, activities, chemicals, and quantities present;

### Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

### Targeted Constituents

Sediment

Nutrients

Trash

Metals ✓

Bacteria

Oil and Grease ✓

Organics ✓

### Minimum BMPs Covered

-  Good Housekeeping
-  Preventative Maintenance
-  Spill and Leak Prevention and Response ✓
-  Material Handling & Waste Management
-  Erosion and Sediment Controls
-  Employee Training Program ✓
-  Quality Assurance Record Keeping ✓



## Spill Prevention, Control & Cleanup SC-11

- ✓ Facility map of the locations of industrial materials;
  - ✓ Notification and evacuation procedures;
  - ✓ Cleanup instructions;
  - ✓ Identification of responsible departments; and
  - ✓ Identify key spill response personnel.
- ☐ Recycle, reclaim, or reuse materials whenever possible. This will reduce the amount of process materials that are brought into the facility.



### ***Spill and Leak Prevention and Response***

#### ***Spill Prevention***

- ☐ Develop procedures to prevent/mitigate spills to storm drain systems. Develop and standardize reporting procedures, containment, storage, and disposal activities, documentation, and follow-up procedures.
- ☐ If illegal dumping is observed at the facility:
- ✓ Post “No Dumping” signs with a phone number for reporting illegal dumping and disposal. Signs should also indicate fines and penalties applicable for illegal dumping.
  - ✓ Landscaping and beautification efforts may also discourage illegal dumping.
  - ✓ Bright lighting and/or entrance barriers may also be needed to discourage illegal dumping.
- ☐ Store and contain liquid materials in such a manner that if the container is ruptured, the contents will not discharge, flow, or be washed into the storm drainage system, surface waters, or groundwater.
- ☐ If the liquid is oil, gas, or other material that separates from and floats on water, install a spill control device (such as a tee section) in the catch basins that collects runoff from the storage tank area.



#### ***Preventative Maintenance***

- ☐ Place drip pans or absorbent materials beneath all mounted taps, and at all potential drip and spill locations during filling and unloading of tanks. Any collected liquids or soiled absorbent materials must be reused/recycled or properly disposed.
- ☐ Store and maintain appropriate spill cleanup materials in a location known to all near the tank storage area; and ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.

## **Spill Prevention, Control & Cleanup SC-11**

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- ❑ Sweep and clean the storage area monthly if it is paved, *do not hose down the area to a storm drain*.
- ❑ Check tanks (and any containment sumps) daily for leaks and spills. Replace tanks that are leaking, corroded, or otherwise deteriorating with tanks in good condition. Collect all spilled liquids and properly dispose of them.
- ❑ Label all containers according to their contents (e.g., solvent, gasoline).
- ❑ Label hazardous substances regarding the potential hazard (corrosive, radioactive, flammable, explosive, poisonous).
- ❑ Prominently display required labels on transported hazardous and toxic materials (per US DOT regulations).
- ❑ Identify key spill response personnel.

### *Spill Response*

- ❑ Clean up leaks and spills immediately.
- ❑ Place a stockpile of spill cleanup materials where it will be readily accessible (e.g., near storage and maintenance areas).
- ❑ On paved surfaces, clean up spills with as little water as possible.
  - ✓ Use a rag for small spills, a damp mop for general cleanup, and absorbent material for larger spills.
  - ✓ If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to a certified laundry (rags) or disposed of as hazardous waste.
  - ✓ If possible use physical methods for the cleanup of dry chemicals (e.g., brooms, shovels, sweepers, or vacuums).
- ❑ Never hose down or bury dry material spills. Sweep up the material and dispose of properly.
- ❑ Chemical cleanups of material can be achieved with the use of adsorbents, gels, and foams. Use adsorbent materials on small spills rather than hosing down the spill. Remove the adsorbent materials promptly and dispose of properly.
- ❑ For larger spills, a private spill cleanup company or Hazmat team may be necessary.

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### *Reporting*

- ☐ Report spills that pose an immediate threat to human health or the environment to the Regional Water Quality Control Board or local authority as location regulations dictate.
- ☐ Federal regulations require that any oil spill into a water body or onto an adjoining shoreline be reported to the National Response Center (NRC) at 800-424-8802 (24 hour).
- ☐ Report spills to 911 for dispatch and clean-up assistance when needed. Do not contact fire agencies directly.
- ☐ Establish a system for tracking incidents. The system should be designed to identify the following:
  - ✓ Types and quantities (in some cases) of wastes;
  - ✓ Patterns in time of occurrence (time of day/night, month, or year);
  - ✓ Mode of dumping (abandoned containers, “midnight dumping” from moving vehicles, direct dumping of materials, accidents/spills);
  - ✓ Clean-up procedures; and
  - ✓ Responsible parties.



### **Employee Training Program**

- ☐ Educate employees about spill prevention and cleanup.
- ☐ Well-trained employees can reduce human errors that lead to accidental releases or spills:
  - ✓ The employee should have the tools and knowledge to immediately begin cleaning up a spill should one occur; and
  - ✓ Employees should be familiar with the Spill Prevention Control and Countermeasure Plan.
- ☐ Employees should be educated about aboveground storage tank requirements. Employees responsible for aboveground storage tanks and liquid transfers should be thoroughly familiar with the Spill Prevention Control and Countermeasure Plan and the plan should be readily available.
- ☐ Train employees to recognize and report illegal dumping incidents.

## **Spill Prevention, Control & Cleanup SC-11**

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### ***Other Considerations (Limitations and Regulations)***

- ❑ State regulations exist for facilities with a storage capacity of 10,000 gallons or more of petroleum to prepare a Spill Prevention Control and Countermeasure (SPCC) Plan (Health & Safety Code Chapter 6.67).
- ❑ State regulations also exist for storage of hazardous materials (Health & Safety Code Chapter 6.95), including the preparation of area and business plans for emergency response to the releases or threatened releases.
- ❑ Consider requiring smaller secondary containment areas (less than 200 sq. ft.) to be connected to the sanitary sewer, prohibiting any hard connections to the storm drain.

### **Requirements**

#### ***Costs (including capital and operation & maintenance)***

- ❑ Will vary depending on the size of the facility and the necessary controls.
- ❑ Prevention of leaks and spills is inexpensive. Treatment and/or disposal of contaminated soil or water can be quite expensive.

#### ***Maintenance (including administrative and staffing)***

- ❑ Develop spill prevention and control plan, provide and document training, conduct inspections of material storage areas, and supply spill kits.
- ❑ Extra time is needed to properly handle and dispose of spills, which results in increased labor costs.

### **Supplemental Information**

#### ***Further Detail of the BMP***

##### ***Reporting***

Record keeping and internal reporting represent good operating practices because they can increase the efficiency of the facility and the effectiveness of BMPs. A good record keeping system helps the facility minimize incident recurrence, correctly respond with appropriate cleanup activities, and comply with legal requirements. A record keeping and reporting system should be set up for documenting spills, leaks, and other discharges, including discharges of hazardous substances in reportable quantities. Incident records describe the quality and quantity of non-stormwater discharges to the storm sewer. These records should contain the following information:

- ❑ Date and time of the incident;
- ❑ Weather conditions;
- ❑ Duration of the spill/leak/discharge;



## **Spill Prevention, Control & Cleanup SC-11**

- ☐ Cause of the spill/leak/discharge;
- ☐ Response procedures implemented;
- ☐ Persons notified; and
- ☐ Environmental problems associated with the spill/leak/discharge.

Separate record keeping systems should be established to document housekeeping and preventive maintenance inspections, and training activities. All housekeeping and preventive maintenance inspections should be documented. Inspection documentation should contain the following information:

- ☐ Date and time the inspection was performed;
- ☐ Name of the inspector;
- ☐ Items inspected;
- ☐ Problems noted;
- ☐ Corrective action required; and
- ☐ Date corrective action was taken.

Other means to document and record inspection results are field notes, timed and dated photographs, videotapes, and drawings and maps.

### *Aboveground Tank Leak and Spill Control*

Accidental releases of materials from aboveground liquid storage tanks present the potential for contaminating stormwater with many different pollutants. Materials spilled, leaked, or lost from tanks may accumulate in soils or on impervious surfaces and be carried away by stormwater runoff.

The most common causes of unintentional releases are:

- ☐ Installation problems;
- ☐ Failure of piping systems (pipes, pumps, flanges, couplings, hoses, and valves);
- ☐ External corrosion and structural failure;
- ☐ Spills and overfills due to operator error; and
- ☐ Leaks during pumping of liquids or gases from truck or rail car to a storage tank or vice versa.

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Storage of reactive, ignitable, or flammable liquids should comply with the Uniform Fire Code and the National Electric Code. Practices listed below should be employed to enhance the code requirements:

- ❑ Tanks should be placed in a designated area.
- ❑ Tanks located in areas where firearms are discharged should be encapsulated in concrete or the equivalent.
- ❑ Designated areas should be impervious and paved with Portland cement concrete, free of cracks and gaps, in order to contain leaks and spills.
- ❑ Liquid materials should be stored in UL approved double walled tanks or surrounded by a curb or dike to provide the volume to contain 10 percent of the volume of all of the containers or 110 percent of the volume of the largest container, whichever is greater. The area inside the curb should slope to a drain.
- ❑ For used oil or dangerous waste, a dead-end sump should be installed in the drain.
- ❑ All other liquids should be drained to the sanitary sewer if available. The drain must have a positive control such as a lock, valve, or plug to prevent release of contaminated liquids.
- ❑ Accumulated stormwater in petroleum storage areas should be passed through an oil/water separator.

Maintenance is critical to preventing leaks and spills. Conduct routine inspections and:

- ❑ Check for external corrosion and structural failure.
- ❑ Check for spills and overfills due to operator error.
- ❑ Check for failure of piping system (pipes, pumps, flanges, coupling, hoses, and valves).
- ❑ Check for leaks or spills during pumping of liquids or gases from truck or rail car to a storage facility or vice versa.
- ❑ Visually inspect new tank or container installation for loose fittings, poor welding, and improper or poorly fitted gaskets.
- ❑ Inspect tank foundations, connections, coatings, and tank walls and piping system. Look for corrosion, leaks, cracks, scratches, and other physical damage that may weaken the tank or container system.
- ❑ Frequently relocate accumulated stormwater during the wet season.

## **Spill Prevention, Control & Cleanup SC-11**

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- Periodically conduct integrity testing by a qualified professional.

### *Vehicle Leak and Spill Control*

Major spills on roadways and other public areas are generally handled by highly trained Hazmat teams from local fire departments or environmental health departments. The measures listed below pertain to leaks and smaller spills at vehicle maintenance shops.

In addition to implementing the spill prevention, control, and clean up practices above, use the following measures related to specific activities:

### *Vehicle and Equipment Maintenance*

- Perform all vehicle fluid removal or changing inside or under cover to prevent the run-on of stormwater and the runoff of spills.
- Regularly inspect vehicles and equipment for leaks, and repair immediately.
- Check incoming vehicles and equipment (including delivery trucks, and employee and subcontractor vehicles) for leaking oil and fluids. Do not allow leaking vehicles or equipment onsite.
- Always use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.
- Immediately drain all fluids from wrecked vehicles.
- Store wrecked vehicles or damaged equipment under cover.
- Place drip pans or absorbent materials under heavy equipment when not in use.
- Use absorbent materials on small spills rather than hosing down the spill.
- Remove the adsorbent materials promptly and dispose of properly.
- Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around.
- Oil filters disposed of in trashcans or dumpsters can leak oil and contaminate stormwater. Place the oil filter in a funnel over a waste oil recycling drum to drain excess oil before disposal. Oil filters can also be recycled. Ask your oil supplier or recycler about recycling oil filters.
- Store cracked batteries in a non-leaking secondary container. Do this with all cracked batteries, even if you think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure it is not leaking.

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### *Vehicle and Equipment Fueling*

- Design the fueling area to prevent the run-on of stormwater and the runoff of spills:

Cover fueling area if possible.

Use a perimeter drain or slope pavement inward with drainage to a sump.

Pave fueling area with concrete rather than asphalt.

- If dead-end sump is not used to collect spills, install an oil/water separator.
- Install vapor recovery nozzles to help control drips as well as air pollution.
- Discourage “topping-off” of fuel tanks.
- Use secondary containment when transferring fuel from the tank truck to the fuel tank.
- Use absorbent materials on small spills and general cleaning rather than hosing down the area. Remove the absorbent materials promptly.
- Carry out all Federal and State requirements regarding underground storage tanks, or install above ground tanks.
- Do not use mobile fueling of mobile industrial equipment around the facility; rather, transport the equipment to designated fueling areas.
- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Train employees in proper fueling and cleanup procedures.

### ***Industrial Spill Prevention Response***

For the purposes of developing a spill prevention and response program to meet the stormwater regulations, facility managers should use information provided in this fact sheet and the spill prevention/response portions of the fact sheets in this handbook, for specific activities.

The program should:

- Integrate with existing emergency response/hazardous materials programs (e.g., Fire Department).
- Develop procedures to prevent/mitigate spills to storm drain systems.
- Identify responsible departments.

## **Spill Prevention, Control & Cleanup SC-11**

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- Develop and standardize reporting procedures, containment, storage, and disposal activities, documentation, and follow-up procedures.
- Address spills at municipal facilities, as well as public areas.
- Provide training concerning spill prevention, response and cleanup to all appropriate personnel.

### **References and Resources**

California's Nonpoint Source Program Plan. <http://www.swrcb.ca.gov/nps/index.html>.

Clark County Storm Water Pollution Control Manual. Available online at:  
<http://www.co.clark.wa.us/pubworks/bmpman.pdf>.

King County Storm Water Pollution Control Manual. Available online at:  
<http://dnr.metrokc.gov/wlr/dss/spcm.htm>.

Orange County Stormwater Program, Best Management Practices for Industrial/Commercial Business Activities. Available online at:  
<http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessesactivities>

Santa Clara Valley Urban Runoff Pollution Prevention Program.  
<http://www.scvurppp.org>.

The Stormwater Managers Resource Center. <http://www.stormwatercenter.net/>.



# Vehicle and Equipment Fueling SC-20

## Description

Spills and leaks that occur during vehicle and equipment fueling can contribute hydrocarbons, oil and grease, as well as heavy metals, to stormwater runoff. Implementing the following management practices can help prevent fuel spills and leaks.

## Approach

- ❑ Reduce potential for pollutant discharge through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

## General Pollution Prevention Protocols

- ❑ Use properly maintained off-site fueling stations whenever possible. These businesses are better equipped to handle fuel and spills properly.
- ❑ Focus pollution prevention activities on containment of spills and leaks, most of which may occur during liquid transfers.



## Good Housekeeping

- ❑ "Spot clean" leaks and drips routinely. Leaks are not cleaned up until the absorbent is picked up and disposed of properly.
- ❑ Manage materials and waste properly (see Material Handling and Waste Management) to reduce adverse impacts on stormwater quality.
- ❑ Paint signs on storm drain inlets to indicate that they are not to receive liquid or solid wastes.
- ❑ Post signs at sinks to remind employees not to pour wastes down drains.

## Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

## Targeted Constituents

Sediment	
Nutrients	
Trash	✓
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

## Minimum BMPs Covered

 Good Housekeeping	✓
 Preventative Maintenance	✓
 Spill and Leak Prevention and Response	✓
 Material Handling & Waste Management	✓
 Erosion and Sediment Controls	
 Employee Training Program	✓
 Quality Assurance Record Keeping	✓



## Vehicle and Equipment Fueling SC-20

- ❑ Clean yard storm drain inlets(s) regularly and especially after large storms.
- ❑ Do not pour materials down storm drains.
- ❑ Build a shed or temporary roof over fueling area to limit exposure to rain.
- ❑ Post signs to remind employees and customers not to top off the fuel tank when filling and signs that ban customers and employees from changing engine oil or other fluids at that location.
- ❑ Report leaking vehicles to fleet maintenance.
- ❑ Ensure the following safeguards are in place:
  - ✓ Overflow protection devices on tank systems to warn the operator or automatically shut down transfer pumps when the tank reaches full capacity.
  - ✓ Protective guards around tanks and piping to prevent vehicle or forklift damage.
  - ✓ Clear tagging or labeling of all valves to reduce human error.
  - ✓ Emergency shut-off and emergency phone number.



### ***Preventative Maintenance***

#### ***Fuel Dispensing Areas***

- ❑ Inspect vehicles and equipment for leaks regularly and repair immediately.
- ❑ Sweep the fueling area weekly, if it is paved, to collect loose particles, and wipe up spills with rags and other absorbent material immediately. Do not hose down the area to a storm drain.
- ❑ Fit underground storage tanks with spill containment and overfill prevention systems meeting the requirements of Section 2635(b) of Title 23 of the California Code of Regulations.
- ❑ Fit fuel dispensing nozzles with "hold-open latches" (automatic shutoffs) except where prohibited by local fire departments.
- ❑ Post signs at the fuel dispenser or fuel island warning vehicle owners/operators against "topping off" of vehicle fuel tanks.
- ❑ Design fueling area to prevent stormwater runoff and spills. Use a perimeter drain or slope pavement inward with drainage to sump; regularly remove materials accumulated in sump.
- ❑ Pave area with concrete rather than asphalt.

## Vehicle and Equipment Fueling SC-20

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- ❑ Cover fueling area with an overhanging roof structure or canopy so that precipitation cannot come in contact with the fueling area. Where covering is not feasible and the fuel island is surrounded by pavement, apply a suitable sealant that protects the asphalt from spilled fuels.
- ❑ Install vapor recovery nozzles to help control drips as well as air pollution.
- ❑ Use secondary containment when transferring fuel from the tank truck to the fuel tank. Cover storm drains in the vicinity during transfer.

### *Air/Water Supply Area*

- ❑ Minimize the possibility of stormwater pollution from air/water supply areas by doing at least one of the following:
  - ✓ Spot clean leaks and drips routinely to prevent runoff of spillage.
  - ✓ Grade and pave the air/water supply area to prevent run-on of stormwater.
  - ✓ Install a roof over the air/water supply area.
  - ✓ Install a low containment berm around the air/water supply area.

### *Inspection*

- ❑ Aboveground Tank Leak and Spill Control:
  - ✓ Check for external corrosion and structural failure.
  - ✓ Check for spills and overfills due to operator error.
  - ✓ Check for failure of piping system.
  - ✓ Check for leaks or spills during pumping of liquids or gases from truck or rail car to a storage facility or vice versa.
  - ✓ Visually inspect new tank or container installation for loose fittings, poor welding, and improper or poorly fitted gaskets.
  - ✓ Inspect tank foundations, connections, coatings, and tank walls and piping system. Look for corrosion, leaks, cracks, scratches, and other physical damage that may weaken the tank or container system.
  - ✓ Conduct integrity testing periodically by a qualified professional.
- ❑ Inspect and clean, if necessary, storm drain inlets and catch basins within the facility boundary before October 1 each year.

# Vehicle and Equipment Fueling SC-20



## ***Spill Response and Prevention Procedures***

- ❑ Keep your spill prevention and control plan up-to-date.
- ❑ Maintain an adequate stockpile of spill cleanup materials at locations where it will be readily accessible.
- ❑ Clean leaks, drips, and other spills with as little water as possible.
  - ✓ Use rags for small spills,
  - ✓ Use a damp mop for general cleanup,
  - ✓ Use dry absorbent material for larger spills.
- ❑ Use the following three-step method for cleaning floors:
  - ✓ Clean spills with rags or other absorbent materials
  - ✓ Sweep floor using dry absorbent material
  - ✓ Mop the floor. Mop water may be discharged to the sanitary sewer via a toilet or sink.
- ❑ Remove the adsorbent materials promptly and dispose of properly when using absorbent materials on small spills.
- ❑ Store portable absorbent booms (long flexible shafts or barriers made of absorbent material) in unbermed fueling areas.
- ❑ Report spills promptly.
- ❑ If a dead-end sump is not used to collect spills, install an oil/water separator.



## ***Material Handling and Waste Management***

- ❑ Do not pour liquid wastes into floor drains, sinks, outdoor storm drain inlets, or other storm drains or sewer connections.
- ❑ Do not put used or leftover cleaning solutions, solvents, and automotive fluids in the sanitary sewer.
- ❑ Collect leaking or dripping fluids in drip pans or containers. Fluids are easier to recycle if kept separate.
- ❑ Promptly transfer used fluids to the proper waste or recycling drums. Do not leave drip pans or other open containers lying around.

## **Vehicle and Equipment Fueling SC-20**

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- ❑ Minimize the possibility of stormwater pollution from outside waste receptacles by doing at least one of the following:
  - ✓ Use only watertight waste receptacle(s) and keep the lid(s) closed.
  - ✓ Grade and pave the waste receptacle area to prevent run-on of stormwater.
  - ✓ Install a roof over the waste receptacle area.
  - ✓ Install a low containment berm around the waste receptacle area.
  - ✓ Use and maintain drip pans under waste receptacles.
- ❑ Post “no littering” signs.



### ***Employee Training Program***

- ❑ Educate employees about facility-wide pollution prevention measures and goals.
- ❑ Train designated employees (e.g., those involved with the handling or management of fuels) on proper fueling and cleanup procedures.
- ❑ Train designated employees upon hiring and annually thereafter on proper methods for handling and disposing of waste. Make sure that all employees understand stormwater discharge prohibitions, wastewater discharge requirements, and these best management practices.
- ❑ Ensure that employees are familiar with the site’s spill control plan and/or proper spill cleanup procedures.
- ❑ Use a training log or similar method to document training. The training log should include entries for:
  - ✓ Training topic,
  - ✓ Trainer,
  - ✓ Attendees,
  - ✓ Frequency,
  - ✓ Comments,
  - ✓ Target date for completion of training, and
  - ✓ Date completed.



# Vehicle and Equipment Fueling SC-20



## **Quality Assurance and Record Keeping**

- ❑ Keep accurate maintenance logs that document minimum BMP activities performed for vehicle and equipment fueling, quantities of materials removed, and improvement actions.
- ❑ Keep accurate logs of spill response actions that document what types of liquids were spilled, how it was cleaned up, and how the waste was disposed.
- ❑ Establish procedures to complete logs and file them in the central office.

## **Potential Capital Facility Costs and Operation & Maintenance Requirements**

### ***Facilities***

- ❑ The retrofitting of existing fueling areas to minimize stormwater exposure or spill runoff can be expensive. Good design must occur during the initial installation. Extruded curb along the “upstream” side of the fueling area to prevent stormwater run-on is of modest cost.
- ❑ Capital investments will likely be required at some sites if adequate cover and containment facilities do not exist and can vary significantly depending upon site conditions.

### ***Maintenance***

- ❑ Most of the operations and maintenance activities associated with implementing this BMP are integrally linked to routine operations as previously described. Therefore additional O&M is not required.
- ❑ For facilities responsible for pre-treating their wastewater prior to discharging, the proper functioning of structural treatment system is an important maintenance consideration.
- ❑ Routine cleanout of sumps and oil/water separators is required for the devices to maintain their effectiveness, usually at least once a month. During periods of heavy rainfall, cleanout is required more often to ensure pollutants are not washed through the system. Sediment removal is also required on a regular basis to keep the device working efficiently.

## **Supplemental Information**

### ***Designing New Installations***

The elements listed below should be included in the design and construction of new or substantially remodeled facilities.

### ***Fuel Dispensing Areas***

- ❑ Fuel dispensing areas must be paved with Portland cement concrete (or, equivalent smooth impervious surface), with a 2 to 4% slope to prevent ponding, and must be

## Vehicle and Equipment Fueling SC-20

separated from the rest of the site by a grade break that prevents run-on of stormwater to the extent practicable. The fuel dispensing area is defined as extending 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assembly may be operated plus 1 foot, whichever is less. The paving around the fuel dispensing area may exceed the minimum dimensions of the "fuel dispensing area" stated above.

- ❑ The fuel dispensing area must be covered, and the cover's minimum dimensions must be equal to or greater than the area within the grade break or the fuel dispensing area, as defined above. The cover must not drain onto the fuel dispensing area.
- ❑ If necessary, install and maintain an oil control device in the appropriate catch basin(s) to treat runoff from the fueling area.

### *Outdoor Waste Receptacle Area*

- ❑ Grade and pave the outdoor waste receptacle area to prevent run-on of stormwater to the extent practicable.

### *Air/Water Supply Area*

- ❑ Grade and pave the air/water supply area to prevent run-on of stormwater to the extent practicable.

### *Designated Fueling Area*

- ❑ If your facility has large numbers of mobile equipment working throughout the site and you currently fuel them with a mobile fuel truck, consider establishing a designated fueling area. With the exception of tracked equipment such as bulldozers and perhaps small forklifts, most vehicles should be able to travel to a designated area with little lost time. Place temporary "caps" over nearby catch basins or manhole covers so that if a spill occurs it is prevented from entering the storm drain.

### **Examples**

The Spill Prevention Control and Countermeasure (SPCC) Plan, which is required by law for some facilities, is an effective program to reduce the number of accidental spills and minimize contamination of stormwater runoff.

The City of Palo Alto has an effective program for commercial vehicle service facilities. Many of the program's elements, including specific BMP guidance and lists of equipment suppliers, are also applicable to industrial facilities.

### **References and Resources**

Orange County Stormwater Program, Best Management Practices for Industrial/Commercial Business Activities. Available online at:

<http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessactivities>.

## **Vehicle and Equipment Fueling SC-20**

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Oregon Department of Environmental Quality, 2013. *Industrial Stormwater Best Management Practices Manual- BMP 8 Vehicle, Pavement and Building Washing*. Available online at: <http://www.deq.state.or.us/wq/wqpermit/docs/IndBMP021413.pdf>

Sacramento Stormwater Management Program. *Best Management Practices for Industrial Storm Water Pollution Control*. Available online at: <http://www.msa.saccounty.net/sactostormwater/documents/guides/industrial-BMP-manual.pdf>.

Sacramento County Environmental Management Stormwater Program: Best Management Practices –Vehicle Washing. Available online at: <http://www.emd.saccounty.net/EnvHealth/Stormwater/Stormwater-BMPs.html>.

Santa Clara Valley Urban Runoff Pollution Prevention Program. <http://www.scvurppp-w2k.com/>.

US EPA. National Pollutant Discharge Elimination System – Stormwater Menu of BMPs - Municipal Vehicle and Equipment Washing, Available online at: <http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=browse&Rbutton=detail&bmp=132>.

Washington State Department of Ecology, 2012. *Vehicle and Equipment Washwater Discharges Best Management Practices Manual*. Publication no. WQ-R-95-056. Available online at: <https://fortress.wa.gov/ecy/publications/publications/95056.pdf>.

# Vehicle and Equipment Cleaning SC-21

## Description

Wash water from vehicle and equipment cleaning activities performed outdoors or in areas where wash water flows onto the ground can contribute toxic hydrocarbons and other organic compounds, oils and greases, nutrients, phosphates, heavy metals, and suspended solids to stormwater runoff. Use of the procedures outlined below can prevent or reduce the discharge of pollutants to stormwater during vehicle and equipment cleaning.

## Approach

Reduce potential for pollutant discharge through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives

### General Pollution Prevention Protocols

- ☐ If possible, use properly maintained off-site commercial washing and steam cleaning businesses whenever possible. These businesses are better equipped to handle and properly dispose of the wash waters.
- ☐ Use dry cleaning methods to remove debris and sweep area; avoid washing with water when possible.
- ☐ Good housekeeping practices can minimize the risk of contamination from wash water discharges.
- ☐ Use biodegradable, phosphate-free detergents for washing vehicles as appropriate
- ☐ Emphasize the connection between the storm drain system and runoff, help reinforce that vehicle and equipment washing activities affect local water quality through storm drain stenciling programs.

## Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

## Targeted Constituents

Sediment	✓
Nutrients	✓
Trash	
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

## Minimum BMPs Addressed

	Good Housekeeping	✓
	Preventative Maintenance	✓
	Spill and Leak Prevention and Response	✓
	Material Handling & Waste Management	✓
	Erosion and Sediment Controls	
	Employee Training Program	✓
	Quality Assurance Record Keeping	✓



# Vehicle and Equipment Cleaning SC-21

- Map on-site storm drain locations to avoid discharges to the storm drain system.
- Designate specific wash area with clarifier or place wash areas away from storm drain connections.



## ***Good Housekeeping***

- Mark the area clearly as a wash area by:
  - ✓ Posting signs stating that only washing is allowed in wash area; and
  - ✓ Providing information on how washing is to be done.
- Provide trash containers in wash area.
- Have all vehicle and equipment washing done in areas designed to collect and hold the wash and rinse water or effluent generated. Recycle, collect or treat wash water effluent prior to discharge to the sanitary sewer system.
- If washing/cleaning must occur on-site, consider washing vehicles and equipment inside the building or on an impervious surface to control the targeted constituents by directing them to the sanitary sewer.
- If washing must occur on-site and outdoor:
  - ✓ Use designated paved wash areas. This area must be covered or bermed to collect the wash water and graded to direct the wash water to a treatment or disposal facility.
  - ✓ Do not conduct oil changes and other engine maintenance in the designated washing area. Perform these activities in a place designated for oil change and maintenance activities.
  - ✓ Cover the wash area when not in use to prevent contact with rain water.
- Do not permit steam cleaning wash water to enter the storm drain system.
- If possible, conduct pressure and steam cleaning at appropriate off-site areas to avoid generating runoff with high pollutant concentrations.



## ***Preventative Maintenance***

- Install sumps or drain lines to collect wash water for treatment.
- Use hoses with nozzles that automatically turn off when left unattended.
- Perform routine inspections of drain lines, holding tanks, and hoses and repair leaks immediately.



## Vehicle and Equipment Cleaning SC-21

- ❑ Perform routine inspection and maintenance of wash water recycling and treatment systems.



### ***Spill Response and Prevention Procedures***

- ❑ Keep the spill prevention and control plan up-to-date.
- ❑ Have an emergency plan, equipment, and trained personnel ready at all times to deal immediately with major spills.
- ❑ Collect all spilled liquids and properly dispose of them.
- ❑ Store and maintain appropriate spill cleanup materials in a location known to all near the designated wash area.



### ***Material Handling and Waste Management***

- ❑ Collect all wash water from vehicle and equipment cleaning operations. Consider treating and reusing or discharging wash waters to a sanitary sewer system.
- ❑ Large quantities of wash waters may require treatment at the facility. Treatment using a process treatment system (e.g., holding tank, filtration system, and related appurtenances) will require engineering and capital expenditures.
- ❑ Collect and treat small amounts of wash water at the facility and either recycle or discharge to the sanitary sewer system or collect and dispose of as an industrial waste.
- ❑ Discharge wash waters into sanitary sewer only after contacting local sewer authority to find out if pretreatment is required.



### ***Employee Training Program***

- ❑ Train employees on proper cleaning and wash water disposal procedures and conduct “refresher” courses on a regular basis.
- ❑ Train staff on proper maintenance measures for the wash area.
- ❑ Train employees and contractors on proper spill containment and cleanup. The employee should have the tools and knowledge to immediately begin cleaning up a spill should one occur.
- ❑ Use a training log or similar method to document training.



### ***Quality Assurance and Record Keeping***

- ❑ Keep accurate maintenance/inspection logs that document the minimum BMP activities performed for vehicle and equipment cleaning activities and improvement actions.

# Vehicle and Equipment Cleaning SC-21

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- ❑ Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.
- ❑ Establish procedures to complete logs and file them in the central office.

## Other Facility-Specific Considerations

- ❑ Some municipalities may require pretreatment and monitoring of wash water discharges to the sanitary sewer.
- ❑ Steam cleaning can generate significant pollutant concentrations requiring that careful consideration be given to the environmental impacts and compliance issues related to the condensate wastewater generated.

## Potential Limitations and Work-Arounds

Some facilities may have space constraints, limited staffing and time limitations that may preclude implementation of certain BMPs. Provided below are typical limitations and recommended “work-arounds”:

- ❑ Most car washing best management practices are inexpensive, and rely more on good housekeeping practices (where vehicles are washed, planning for the collection of wash water) than on expensive technology. However, the construction of a specialized area for vehicle washing can be expensive. Also, for facilities that cannot recycle their wash water, the cost of pre-treating wash water through either structural practices or planning for collection and hauling of contaminated water to sewage treatment plants can be cost-prohibitive.
- ❑ A potential work-around is to use properly maintained off-site commercial washing and steam cleaning businesses whenever possible.

## Potential Capital Facility Costs and Operation & Maintenance Requirements

### *Facilities*

- ❑ Many facilities will already have indoor covered areas where vehicle and equipment cleaning takes place and will require no additional capital expenditures for providing cover.
- ❑ Capital investments will be required at some sites if systems to collect and recycle/treat and properly discharge wash water are not in place. The cost associated with these investments will vary depending on the size of the washing facility and local regulations regarding effluent wash water.

### *Maintenance*

- ❑ Perform wash and collection system inspections and repair.
- ❑ Sweep washing areas frequently to remove solid debris.

# **Vehicle and Equipment Cleaning SC-21**

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- Repair berms and dikes as necessary.
- Inspect and maintain sumps, oil/water separators, and on-site treatment/recycling units.

## **Supplemental Information**

### ***Designated Cleaning Areas***

- Washing operations outside should be conducted in a designated wash area having the following characteristics:
  - ✓ Paved with Portland cement concrete
  - ✓ Covered and bermed to prevent contact with stormwater and contain wash water
  - ✓ Sloped for wash water collections
  - ✓ Drainage system for wash water to the sanitary or recycle treatment process waste sewer, or to a dead-end sump equipped with an oil/water separator if necessary.

## **References and Resources**

Orange County Stormwater Program, Best Management Practices for Industrial/Commercial Business Activities. Available online at: <http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessactivities>.

Oregon Department of Environmental Quality, 2013. *Industrial Stormwater Best Management Practices Manual- BMP 8 Vehicle, Pavement and Building Washing*. Available online at: <http://www.deq.state.or.us/wq/wqpermit/docs/IndBMP021413.pdf>.

Sacramento Stormwater Management Program. *Best Management Practices for Industrial Storm Water Pollution Control*. Available online at: <http://www.msa.saccounty.net/sactostormwater/documents/guides/industrial-BMP-manual.pdf>.

Sacramento County Environmental Management Stormwater Program: Best Management Practices –Vehicle Washing. Available online at: <http://www.emd.saccounty.net/EnvHealth/Stormwater/Stormwater-BMPs.html>.

Santa Clara Valley Urban Runoff Pollution Prevention Program. <http://www.scvurppp-w2k.com/>.

US EPA. National Pollutant Discharge Elimination System – Stormwater Menu of BMPs - Municipal Vehicle and Equipment Washing. Available online at: <http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=browse&Rbut ton=detail&bmp=132>.

## **Vehicle and Equipment Cleaning SC-21**

Washington State Department of Ecology, 2012 .*Vehicle and Equipment Washwater Discharges Best Management Practices Manual*. Publication no. WQ-R-95-056.  
Available online at: <https://fortress.wa.gov/ecy/publications/publications/95056.pdf>.

# Vehicle and Equipment Repair SC-22

## Description

Vehicle or equipment maintenance and repair are potentially significant sources of stormwater pollution, due to use of harmful materials and wastes during maintenance and repair processes. Engine repair and service (e.g., parts cleaning), replacement of fluids (e.g., oil change), and outdoor equipment storage and parking (leaking vehicles) can impact water quality if stormwater runoff from areas with these activities becomes polluted by a variety of contaminants. Implementation of the following activities must be done where applicable to prevent or reduce the discharge of pollutants to stormwater from vehicle and equipment maintenance and repair activities.

## Approach

The BMP approach is to reduce the potential for pollutant discharges through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives. General pollution prevention protocols are presented followed by applicable minimum BMPs as required by the Industrial General Permit.

### General Pollution Prevention Protocols

- ☐ Designate a vehicle maintenance area designed to prevent stormwater pollution.
- ☐ Minimize contact of stormwater with outside operations through berming and appropriate drainage routing.
- ☐ Keep accurate maintenance logs to evaluate materials removed and improvements made.
- ☐ Switch to non-toxic chemicals for maintenance when possible.
- ☐ Choose cleaning agents that can be recycled.
- ☐ Use drop cloths and drip pans.

## Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

## Targeted Constituents

Sediment

Nutrients

Trash

Metals ✓

Bacteria

Oil and Grease ✓

Organics ✓

## Minimum BMPs Covered

	Good Housekeeping	✓
	Preventative Maintenance	✓
	Spill and Leak Prevention and Response	✓
	Material Handling & Waste Management	✓
	Erosion and Sediment Controls	
	Employee Training Program	✓
	Quality Assurance Record Keeping	✓





## Vehicle and Equipment Repair SC-22

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- ☐ Minimize use of solvents. Clean parts without using solvents whenever possible, or use water-based solvents for cleaning.
- ☐ Recycle used motor oil, diesel oil, and other vehicle fluids and parts whenever possible.

### ***Operational Protocols***

#### *General*

- ☐ Move maintenance and repair activities indoors whenever feasible.
- ☐ Place curbs around the immediate boundaries of process equipment.



#### ***Good Housekeeping***

- ☐ Store idle equipment under cover
- ☐ Use a vehicle maintenance area designed to prevent stormwater pollution - minimize contact of stormwater with outside operations through berming and appropriate drainage routing.
- ☐ Avoid hosing down your work areas. If work areas are washed, collect and direct wash water to sanitary sewer. Use dry sweeping if possible.
- ☐ Paint signs on storm drain inlets to indicate that they are not to receive liquid or solid wastes.
- ☐ Post signs at sinks to remind employees not to pour wastes down drains.
- ☐ Clean yard storm drain inlets(s) regularly and especially after large storms.
- ☐ Do not pour materials down storm drains.
- ☐ Cover the work area to limit exposure to rain.
- ☐ Place curbs around the immediate boundaries of process equipment.
- ☐ Build a shed or temporary roof over areas where parked cars await repair or salvage, especially wrecked vehicles. Build a roof over vehicles kept for parts.



#### ***Preventive Maintenance and Repair Activities***

- ☐ Provide a designated area for vehicle maintenance.
- ☐ Inspect vehicles and equipment for leaks regularly and repair immediately.
- ☐ Make sure incoming vehicles are checked for leaking oil and fluids. Do not allow leaking vehicles or equipment on-site without correcting the source of the leak and cleaning up any spill.
- ☐ Keep equipment clean; don't allow excessive build-up of oil and grease.

## Vehicle and Equipment Repair SC-22

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- ❑ Perform all vehicle fluid removal or changing inside or under cover if possible to prevent the run-on of stormwater and the runoff of spills.
- ❑ Use a tarp, ground cloth, or drip pans beneath the vehicle or equipment to capture all spills and drips if temporary work is being conducted outside. Collected drips and spills must be disposed, reused, or recycled properly.
- ❑ It is important to sweep the maintenance area weekly, if it is paved, to collect loose particles, and wipe up spills with rags and other absorbent material immediately. Do not hose down the area to a storm drain.
- ❑ Establish standard procedures to prevent spillage/leakage of fluids including:
  - ✓ Keep a drip pan under the vehicle while you unclip hoses, unscrew filters, or remove other parts. Use a drip pan under any vehicle that might leak while working on it to keep splatters or drips off the shop floor.
  - ✓ Promptly transfer used fluids to the proper waste or recycling drums. Do not leave drip pans or other open containers lying around.
  - ✓ Keep drip pans or containers under vehicles or equipment that may drip during repairs.
  - ✓ Do not change motor oil or perform equipment maintenance in non-appropriate areas.
- ❑ Drain oil and other fluids first if the vehicle or equipment is to be stored outdoors. Elevate and tarp stored vehicles and equipment.
- ❑ Monitor parked vehicles closely for leaks. Pans should be placed under any leaks to collect the fluids for proper disposal or recycling.
- ❑ Mechanics should clean vehicle parts without using liquid cleaners wherever possible to reduce waste.
- ❑ Steam cleaning and pressure washing may be used instead of solvent parts cleaning. The wastewater generated from steam cleaning must be discharged to an on-site oil water separator that is connected to a sanitary sewer or blind sump. Non-caustic detergents should be used instead of caustic cleaning agents, detergent-based or water-based cleaning systems in place of organic solvent degreasers, and non-chlorinated solvent in place of chlorinated organic solvents for parts cleaning. Refer to SC21 for more information on steam cleaning.
- ❑ Fifth-wheel bearings on trucks require routine lubrication. Typically chassis grease is applied to the fifth-wheel bearing at rates that result in grease dripping off of the bearing into the environment. To address this concern the following options are available:
  - ✓ Use specialized lubricants with good adhesion (e.g., stay in place) properties. Carefully follow manufacturer's label regarding the use of adhesive lubricant for

## Vehicle and Equipment Repair SC-22

truck fifth-wheels. Typically this means applying no more than 8 oz. of grease. No visible extrusion of lubricant from the fifth-wheel bearing when truck and trailer are connected should be present.

- ✓ Use on-board truck or on-board trailer automatic lubrication systems. If these systems apply lube thinner than National Grease Lubrication Institute #2, equipment for collection of used lubricant is needed to prevent excess lubricant from dripping off the truck.
- ✓ Use plastic or Teflon plates instead of grease or other lubricants. Carefully follow manufacturer's instructions for installation and operation.
- Use one of the following for lubricating vehicle-trailer coupling:
  - ✓ Specialized adhesive lubricants;
  - ✓ Grease-free fifth wheel slip plates (e.g., plastic or Teflon coatings); and
  - ✓ On-Board automatic lubricating systems.



### ***Spill and Leak Prevention and Response Procedures***

- Keep your spill prevention and control plan up-to-date.
- Place an adequate stockpile of spill cleanup materials where it will be readily accessible.
- Clean leaks, drips, and other spills with as little water as possible. Use rags for small spills, a damp mop for general cleanup, and dry absorbent material for larger spills. Use the following three-step method for cleaning floors:
  - ✓ Clean spills with rags or other absorbent materials;
  - ✓ Sweep floor using dry absorbent material; and
  - ✓ Mop the floor.

Mop water may be discharged to the sanitary sewer via a toilet or sink.

- Remove the adsorbent materials promptly and dispose of properly when using adsorbent materials on small spills.



### ***Material Handling and Waste Management***

- Designate a special area to drain and replace motor oil, coolant, and other fluids, where there are no connections to the storm drain or the sanitary sewer, and drips and spills can be easily cleaned up.
- Drain all fluids immediately from wrecked vehicles. Ensure that the drain pan or drip pan is large enough to contain drained fluids (e.g., larger pans are needed to contain antifreeze, which may gush from some vehicles).

## Vehicle and Equipment Repair SC-22

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- ☐ Do not pour liquid waste to floor drains, sinks, outdoor storm drain inlets, or other storm drains or sewer connections.
- ☐ Do not put used or leftover cleaning solutions, solvents, and automotive fluids and in the sanitary sewer.
- ☐ Collect leaking or dripping fluids in drip pans or containers. Fluids are easier to recycle if kept separate.
- ☐ Promptly transfer used fluids to the proper waste or recycling drums. Do not leave drip pans or other open containers lying around.
- ☐ Place oil filter in a funnel over a waste oil recycling drum to drain excess oil before disposal since municipalities prohibit or discourage disposal of these items in solid waste facilities.
- ☐ Oil filters can also be recycled. Ask your oil supplier or recycler about recycling oil filters. Oil filters disposed of in trashcans or dumpsters can leak oil and contaminate stormwater.
- ☐ Store cracked batteries in a non-leaking secondary container and dispose of properly at recycling or household hazardous waste facilities.



### ***Employee Training Program***

- ☐ Train employees and contractors in the proper handling and disposal of engine fluids and waste materials.
- ☐ Employees should have the tools and knowledge to immediately begin cleaning up a spill should one occur.
- ☐ Conduct annual training to ensure that employees are familiar with the facility's spill control plan and/or proper spill cleanup procedures (You can use reusable cloth rags to clean up small drips and spills instead of disposables; these can be washed by a permitted industrial laundry. Do not clean them at home or at a coin-operated laundry business).
- ☐ Use a training log or similar method to document training.



### ***Quality Assurance and Recordkeeping***

- ☐ Keep accurate maintenance logs to evaluate materials removed and improvements made.
- ☐ Establish procedures to collect and file maintenance logs in the central office.

# Vehicle and Equipment Repair SC-22

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## ***Other Facility-Specific Considerations***

### ***Parts Cleaning***

Vehicle and equipment maintenance facilities often must clean parts as a part of day-to-day operations. The following activities should be considered:

- ❑ Clean vehicle parts without using liquid cleaners wherever possible to reduce waste.
- ❑ Steam cleaning and pressure washing may be used instead of solvent parts cleaning.
- ❑ Wastewater generated from steam cleaning must be discharged to an on-site oil water separator that is connected to a sanitary sewer or blind sump.
- ❑ Use non-caustic detergents instead of caustic cleaning agents, detergent-based or water-based cleaning systems in place of organic solvent degreasers, and non-chlorinated solvent in place of chlorinated organic solvents for parts cleaning. Refer to SC21 for more information on steam cleaning.

### ***Potential Limitations and Work-Arounds***

- ❑ Some facilities may have space constraints and time limitations that may preclude all work from being conducted indoors.
  - ✓ Designate specific areas for outdoor activities.
  - ✓ Require employees to understand and follow preventive maintenance and spill and leak prevention BMPs.
- ❑ It may not be possible to contain and clean up spills from vehicles/equipment brought on-site after working hours.
  - ✓ Provide a designated area for afterhours deliveries.
  - ✓ Install spill kits.
- ❑ Drain pans (usually 1 ft. x 1 ft.) are generally too small to contain antifreeze
  - ✓ Purchase or fabricate large drip pans (3 ft. x 3 ft.) with sufficient volume to contain expected quantities of liquids based on equipment/vehicle specifications.
- ❑ Dry floor cleaning methods may not be sufficient for some spills.
  - ✓ Use three-step method instead.
- ❑ Identification of engine leaks may require some use of solvents.
  - ✓ Minimize the use of solvents and use drip pans to collect spills and leaks.
- ❑ Prices for recycled materials and fluids may be higher than those of non-recycled materials.



## Vehicle and Equipment Repair SC-22

- Some facilities may be limited by a lack of providers of recycled materials, and by the absence of businesses to provide services such as hazardous waste removal, structural treatment practice maintenance, or solvent equipment and solvent recycling.

### Potential Facilities and Maintenance Requirements

#### *Facilities Requirements*

- For facilities that already have covered areas where maintenance takes place, have berms or other means to retain spills and leaks, and/ have other appropriate constructed systems for containment, there may not need to be any significant new capital investment. Capital costs will likely be required at some sites if adequate cover and containment facilities do not exist and can vary significantly depending upon site conditions.



#### *Maintenance Requirements*

- Most of the operations and maintenance activity associated with implementing this BMP are integrally linked to routine operations as previously described. Therefore, significant additional operations and maintenance efforts are not likely to be required.
- For facilities responsible for pre-treating their wastewater prior to discharging, the proper functioning of structural treatment system is an important maintenance consideration. Routine cleanout of oil and grease is required for the devices to maintain their effectiveness, usually at least once a month. During periods of heavy rainfall, cleanout is required more often to ensure pollutants are not washed through the trap. Sediment removal is also required on a regular basis to keep the device working efficiently.
- It is important to sweep the maintenance area weekly, if it is paved, to collect loose particles, and wipe up spills with rags and other absorbent material immediately. Do not hose down the area to a storm drain.

### Supplemental Information

#### *Waste Reduction*

Parts are often cleaned using solvents such as trichloroethylene, 1,1,1-trichloroethane or methylene chloride. Many of these cleaners are harmful and must be disposed of as a hazardous waste. Cleaning without using liquid cleaners (e.g., wire brush) whenever possible reduces waste. Prevent spills and drips of solvents and cleansers to the shop floor. Do all liquid cleaning at a centralized station so the solvents and residues stay in one area. Locate drip pans, drain boards, and drying racks to direct drips back into a solvent sink or fluid holding tank for reuse. Reducing the number of solvents makes recycling easier and reduces hazardous waste management costs. Often, one solvent can perform a job as well as two different solvents.

- Clean parts without using liquid cleaners whenever possible to reduce waste.
- Prevent spills and drips of solvents and cleansers to the shop floor.

## Vehicle and Equipment Repair SC-22

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- ☐ Do all liquid cleaning at a centralized station so the solvents and residues stay in one area.
- ☐ Locate drip pans, drain boards, and drying racks to direct drips back into a solvent sink or fluid holding tank for reuse.

### ***Recycling***

Separating wastes allows for easier recycling and may reduce treatment costs. Keep hazardous and non-hazardous wastes separate, do not mix used oil and solvents, and keep chlorinated solvents (e.g., 1,1,1-trichloroethane) separate from non-chlorinated solvents (e.g., kerosene and mineral spirits).

Many products made of recycled (i.e., refined or purified) materials are available. Engine oil, transmission fluid, antifreeze, and hydraulic fluid are available in recycled form. Buying recycled products supports the market for recycled materials.

- ☐ Recycling is always preferable to disposal of unwanted materials.
- ☐ Separate wastes for easier recycling. Keep hazardous and non-hazardous wastes separate, do not mix used oil and solvents, and keep chlorinated solvents separate from non-chlorinated solvents.
- ☐ Label and track the recycling of waste material (e.g., used oil, spent solvents, batteries).
- ☐ Purchase recycled products to support the market for recycled materials.

### ***Safer Alternatives***

If possible, eliminate or reduce the amount of hazardous materials and waste by substituting non-hazardous or less hazardous material:

- ☐ Use non-caustic detergents instead of caustic cleaning for parts cleaning.
- ☐ Use detergent-based or water-based cleaning systems in place of organic solvent degreasers. Wash water may require treatment before it can be discharged to the sewer.
- ☐ Replace chlorinated organic solvents with non-chlorinated solvents. Non-chlorinated solvents like kerosene or mineral spirits are less toxic and less expensive to dispose of properly. Check list of active ingredients to see whether it contains chlorinated solvents.
- ☐ Choose cleaning agents that can be recycled.

### **References and Resources**

Orange County Stormwater Program, Best Management Practices for Industrial/Commercial Business Activities. Available online at: <http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessesactivities>.

## **Vehicle and Equipment Repair SC-22**

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Oregon Department of Environmental Quality, 2013. *Industrial Stormwater Best Management Practices Manual- BMP 8 Vehicle, Pavement and Building Washing*. Available online at: <http://www.deq.state.or.us/wq/wqpermit/docs/IndBMP021413.pdf>.

Sacramento Stormwater Management Program. *Best Management Practices for Industrial Storm Water Pollution Control*. Available online at: <http://www.msa.saccounty.net/sactostormwater/documents/guides/industrial-BMP-manual.pdf>.

Sacramento County Environmental Management Stormwater Program: Best Management Practices –Vehicle Washing. Available online at: <http://www.emd.saccounty.net/EnvHealth/Stormwater/Stormwater-BMPs.html>.

Santa Clara Valley Urban Runoff Pollution Prevention Program <http://www.scvurppp-w2k.com/>.

US EPA, National Pollutant Discharge Elimination System – Stormwater Menu of BMPs - Municipal Vehicle and Equipment Washing. Available online at: <http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=browse&Rbutton=detail&bmp=132>.

Washington State Department of Ecology, 2012. *Vehicle and Equipment Washwater Discharges Best Management Practices Manual*. Publication no. WQ-R-95-056. Available online at: <https://fortress.wa.gov/ecy/publications/publications/95056.pdf>.

# Outdoor Loading/Unloading SC-30

## Description

The loading/unloading of materials usually takes place outside on docks or terminals; therefore, materials spilled, leaked, or lost during loading/unloading may collect in the soil or on other surfaces and have the potential to be carried away by wind, stormwater runoff or when the area is cleaned. Additionally, rainfall may wash pollutants from machinery used to unload or move materials. Implementation of the following protocols will prevent or reduce the discharge of pollutants to stormwater from outdoor loading/unloading of materials.

## Approach

Reduce potential for pollutant discharge through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

## General Pollution Prevention Protocols

- ☐ Park tank trucks or delivery vehicles in designated areas so that spills or leaks can be contained.
- ☐ Limit exposure of material to rainfall whenever possible.
- ☐ Prevent stormwater run-on.
- ☐ Check equipment regularly for leaks.



## Good Housekeeping

- ☐ Develop an operations plan that describes procedures for loading and/or unloading.
- ☐ Conduct loading and unloading in dry weather if possible.

## Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

## Targeted Constituents

<i>Sediment</i>	✓
<i>Nutrients</i>	✓
<i>Trash</i>	
<i>Metals</i>	✓
<i>Bacteria</i>	
<i>Oil and Grease</i>	✓
<i>Organics</i>	✓

## Minimum BMPs Covered

	<i>Good Housekeeping</i>	✓
	<i>Preventative Maintenance</i>	
	<i>Spill and Leak Prevention and Response</i>	✓
	<i>Material Handling &amp; Waste Management</i>	✓
	<i>Erosion and Sediment Controls</i>	
	<i>Employee Training Program</i>	✓
	<i>Quality Assurance Record Keeping</i>	✓





# Outdoor Loading/Unloading SC-30

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- ☐ Cover designated loading/unloading areas to reduce exposure of materials to rain.
- ☐ Consider placing a seal or door skirt between delivery vehicles and building to prevent exposure to rain.
- ☐ Design loading/unloading area to prevent stormwater run-on, which would include grading or berming the area, and position roof downspouts so they direct stormwater away from the loading/unloading areas.
- ☐ Have employees load and unload all materials and equipment in covered areas such as building overhangs at loading docks if feasible.
- ☐ Load/unload only at designated loading areas.
- ☐ Use drip pans underneath hose and pipe connections and other leak-prone spots during liquid transfer operations, and when making and breaking connections. Several drip pans should be stored in a covered location near the liquid transfer area so that they are always available, yet protected from precipitation when not in use. Drip pans can be made specifically for railroad tracks. Drip pans must be cleaned periodically, and drip collected materials must be disposed of properly.
- ☐ Pave loading areas with concrete instead of asphalt.
- ☐ Avoid placing storm drains inlets in the area.
- ☐ Grade and/or berm the loading/unloading area with drainage to sump; regularly remove materials accumulated in sump.



## ***Spill Response and Prevention Procedures***

- ☐ Keep your spill prevention and control plan up-to-date or have an emergency spill cleanup plan readily available, as applicable.
- ☐ Contain leaks during transfer.
- ☐ Store and maintain appropriate spill cleanup materials in a location that is readily accessible and known to all employees.
- ☐ Ensure that employees are familiar with the site's spill control plan and proper spill cleanup procedures.
- ☐ Use drip pans or comparable devices when transferring oils, solvents, and paints.



## ***Material Handling and Waste Management***

- ☐ Spot clean leaks and drips routinely to prevent runoff of spillage.
- ☐ Do not pour liquid wastes into floor drains, sinks, outdoor storm drain inlets, or other storm drains or sewer connections.



# Outdoor Loading/Unloading SC-30

- ☐ Do not put used or leftover cleaning solutions, solvents, and automotive fluids in the storm drain or sanitary sewer.
- ☐ Collect leaking or dripping fluids in drip pans or containers. Fluids are easier to recycle if kept separate.
- ☐ Promptly transfer used fluids to the proper waste or recycling drums. Do not leave drip pans or other open containers lying around.
- ☐ Minimize the possibility of stormwater pollution from outside waste receptacles by doing at least one of the following:
  - ✓ Use only watertight waste receptacle(s) and keep the lid(s) closed.
  - ✓ Grade and pave the waste receptacle area to prevent run-on of stormwater.
  - ✓ Install a roof over the waste receptacle area.
  - ✓ Install a low containment berm around the waste receptacle area.
  - ✓ Use and maintain drip pans under waste receptacles.
- ☐ Post “no littering” signs.
- ☐ Perform work area clean-up and dry sweep after daily operations.



## ***Employee Training Program***

- ☐ Train employees (e.g., fork lift operators) and contractors on proper spill containment and cleanup.
- ☐ Have employees trained in spill containment and cleanup present during loading/unloading.
- ☐ Train employees in proper handling techniques during liquid transfers to avoid spills.
- ☐ Make sure forklift operators are properly trained on loading and unloading procedures.



## ***Quality Assurance and Record Keeping***

- ☐ Keep accurate maintenance logs that document activities performed, quantities of materials removed, and improvement actions.
- ☐ Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.
- ☐ Establish procedures to complete logs and file them in the central office.
- ☐ Keep accurate logs of daily clean-up operations.

# Outdoor Loading/Unloading SC-30

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## Potential Limitations and Work-Arounds

Some facilities may have space constraints, limited staffing and time limitations that may preclude implementation of BMPs. Provided below are typical limitations and recommended “work-arounds.”

- ❑ Space and time limitations may preclude all transfers from being performed indoors or under cover.
  - ✓ Designate specific areas for outdoor loading and unloading.
  - ✓ Require employees to understand and follow spill and leak prevention BMPs.
- ❑ It may not be possible to conduct transfers only during dry weather.
  - ✓ Limit materials and equipment rainfall exposure to all extents practicable.
  - ✓ Require employees to understand and follow spill and leak prevention BMPs.

## Potential Capital Facility Costs and Operation & Maintenance Requirements

### *Facilities*

Many facilities will already have indoor or covered areas where loading/unloading takes place and will require no additional capital expenditures.

If outdoor activities are required, construction of berms or other means to retain spills and leaks may require appropriate constructed systems for containment. These containment areas may require significant new capital investment.

Capital investments will likely be required at some sites if adequate cover and containment facilities do not exist and can vary significantly depending upon site conditions.

### *Maintenance*

Most of the operations and maintenance activities associated with implementing this BMP are integrally linked to routine operations as previously described. Therefore additional O&M is not required.

- ❑ Conduct regular inspections and make repairs and improvements as necessary.
- ❑ Check loading and unloading equipment regularly for leaks.
- ❑ Conduct regular broom dry-sweeping of area. Do not wash with water.

## Supplemental Information

### *Loading and Unloading of Liquids*

- ❑ Loading or unloading of liquids should occur in the manufacturing building so that any spills that are not completely retained can be discharged to the sanitary sewer,

# Outdoor Loading/Unloading SC-30

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treatment plant, or treated in a manner consistent with local sewer authorities and permit requirements.

- For loading and unloading tank trucks to above and below ground storage tanks, the following procedures should be used:
  - ✓ The area where the transfer takes place should be paved. If the liquid is reactive with the asphalt, Portland cement should be used to pave the area.
  - ✓ The transfer area should be designed to prevent run-on of stormwater from adjacent areas. Sloping the pad and using a curb, like a speed bump, around the uphill side of the transfer area should reduce run-on.
  - ✓ The transfer area should be designed to prevent runoff of spilled liquids from the area. Sloping the area to a drain should prevent runoff. The drain should be connected to a dead-end sump or to the sanitary sewer. A positive control valve should be installed on the drain.
- For transfer from rail cars to storage tanks that must occur outside, use the following procedures:
  - ✓ Drip pans should be placed at locations where spillage may occur, such as hose connections, hose reels, and filler nozzles. Use drip pans when making and breaking connections.
  - ✓ Drip pan systems should be installed between the rails to collect spillage from tank cars.

## References and Resources

Minnesota Pollution Control Agency, *Industrial Stormwater Best Management Practices Guidebook BMP 26 Fueling and Liquid Loading/Unloading Operations*. Available online at: <http://www.pca.state.mn.us/index.php/view-document.html?gid=10557>.

New Jersey Department of Environmental Protection, 2013. *Basic Industrial Stormwater General Permit Guidance Document NJPDES General Permit No NJ0088315*. Available online at: [http://www.nj.gov/dep/dwq/pdf/5G2\\_guidance\\_color.pdf](http://www.nj.gov/dep/dwq/pdf/5G2_guidance_color.pdf).

Orange County Stormwater Program, Best Management Practices for Industrial/Commercial Business Activities. Available online at: <http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessactivities>.

Oregon Department of Environmental Quality, 2013. *Industrial Stormwater Best Management Practices Manual- BMP 26 Fueling and Liquid Loading/Unloading Operations*. Available online at: <http://www.deq.state.or.us/wq/wqpermit/docs/IndBMP021413.pdf>.

## **Outdoor Loading/Unloading SC-30**

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Sacramento Stormwater Management Program, *Best Management Practices for Industrial Storm Water Pollution Control*. Available online at:  
<http://www.msa.saccounty.net/sactostormwater/documents/guides/industrial-BMP-manual.pdf>.

Sacramento County Environmental Management Stormwater Program: *Best Management Practices*. Available online at:  
<http://www.emd.saccounty.net/EnvHealth/Stormwater/Stormwater-BMPs.html>.

Santa Clara Valley Urban Runoff Pollution Prevention Program. <http://www.scvurppp-w2k.com/>.

US EPA. National Pollutant Discharge Elimination System – Industrial Fact Sheet Series for Activities Covered by EPA's Multi Sector General Permit. Available online at:  
<http://cfpub.epa.gov/npdes/stormwater/swsectors.cfm>.

# Outdoor Liquid Container Storage SC-31

## Description

Accidental releases of materials from above ground liquid storage tanks, drums, and dumpsters present the potential for contaminating stormwater with many different pollutants. Tanks may store many potential stormwater runoff pollutants, such as gasoline, aviation gas, diesel fuel, kerosene, oils, greases, lubricants and other distilled, blended and refined products derived from crude petroleum. Materials spilled, leaked, or lost from storage tanks may accumulate in soils or on other surfaces and be carried away by rainfall runoff. These source controls apply to containers located outside of a building used to temporarily store liquid materials and include installing safeguards against accidental releases, installing secondary containment, conducting regular inspections, and training employees in standard operating procedures and spill cleanup techniques.

## Approach

### General Pollution Prevention Protocols

- ☐ Educate employees about pollution prevention measures and goals.
- ☐ Keep an accurate, up-to-date inventory of the materials delivered and stored on-site.
- ☐ Try to keep chemicals in their original containers, and keep them well labeled.
- ☐ Develop an operations plan that describes procedures for loading and/or unloading. Refer to SC-30 Outdoor Loading/Unloading of Materials for more detailed BMP information pertaining to loading and unloading of liquids.
- ☐ Protect materials from rainfall, run-on, runoff, and wind dispersal:
  - ✓ Cover the storage area with a roof.

## Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize

## Targeted Constituents

<i>Sediment</i>	
<i>Nutrients</i>	✓
<i>Trash</i>	
<i>Metals</i>	✓
<i>Bacteria</i>	
<i>Oil and Grease</i>	✓
<i>Organics</i>	✓

## Minimum BMPs Covered

	<i>Good Housekeeping</i>	
	<i>Preventative Maintenance</i>	✓
	<i>Spill and Leak Prevention and Response</i>	✓
	<i>Material Handling &amp; Waste Management</i>	✓
	<i>Erosion and Sediment Controls</i>	
	<i>Employee Training Program</i>	✓
	<i>Quality Assurance Record Keeping</i>	✓





## Outdoor Liquid Container Storage **SC-31**

- ✓ Minimize stormwater run-on by enclosing the area or building a berm around it.
- ✓ Use a walled structure for storage of liquid containers.
- ✓ Use only watertight containers and keep the lids closed.
- Employ safeguards against accidental releases:
  - ✓ Provide overflow protection devices to warn operator or automatic shutdown transfer pumps.
  - ✓ Provide protection guards (bollards) around tanks and piping to prevent damage from a vehicle or forklift.
  - ✓ Provide clear tagging or labeling, and restrict access to valves to reduce human error.
  - ✓ Berm or surround tank or container with secondary containment system, including dikes, liners, vaults, or double walled tanks.
  - ✓ Be aware and ready to address the fact that some municipalities require secondary containment areas to be connected to the sanitary sewer, prohibiting any hard connections to the storm drain.
  - ✓ Contact the appropriate regulatory agency regarding environmental compliance for facilities with “spill ponds” designed to intercept, treat, and/or divert spills.
  - ✓ Have registered and specifically trained professional engineers identify and correct potential problems such as loose fittings, poor welding, and improper or poorly fitted gaskets for newly installed tank systems.
- Use MSDSs to ID hazardous components and keep incompatible products apart and to list/have available appropriate PPE and clean-up products.



### **Good Housekeeping**

- Provide storage tank piping located below product level with a shut-off valve at the tank; ideally this valve should be an automatic shear valve with the shut-off located inside the tank.
- Provide barriers such as posts or guardrails, where tanks are exposed, to prevent collision damage with vehicles.
- Provide secure storage to prevent vandalism-caused contamination.
- Place tight-fitting lids on containers.

## Outdoor Liquid Container Storage **SC-31**

- ☐ Enclose or cover the containers where they are stored.
- ☐ Raise the containers off the ground by use of pallet or similar method, with provisions for spill control.
- ☐ Do not store liquid containers near the storm drainage system or surface waters.
- ☐ Sweep and clean the storage area regularly if it is paved, do not hose down the area to a storm drain.



### ***Preventative Maintenance***

- ☐ Inspect storage areas regularly for leaks or spills.
- ☐ Conduct routine inspections and check for external corrosion of material containers. Also check for structural failure, spills and overfills due to operator error, failure of piping system.
- ☐ Check for leaks or spills during pumping of liquids or gases from truck or rail car to a storage facility or vice versa.
- ☐ Visually inspect new tank or container installations for loose fittings, poor welding, and improper or poorly fitted gaskets.
- ☐ Inspect tank foundations, connections, coatings, and tank walls and piping system. Look for corrosion, leaks, cracks, scratches, and other physical damage that may weaken the tank or container system.
- ☐ Replace containers that are leaking, corroded, or otherwise deteriorating with ones in good condition. If the liquid chemicals are corrosive, containers made of compatible materials must be used instead of metal drums.
- ☐ New or secondary containers must be labeled with the product name and hazards.



### ***Spill Response and Prevention Procedures***

- ☐ Keep your spill prevention and control plan up-to-date.
- ☐ Maintain an adequate stockpile of spill cleanup materials at locations where it will be readily accessible.
- ☐ Have an emergency plan, equipment, and trained personnel ready at all times to deal immediately with major spills.
- ☐ Collect spilled liquids and properly dispose of them.
- ☐ Remove the adsorbent materials promptly and dispose of properly when using adsorbent materials on small spills.
- ☐ Have employees trained in emergency spill cleanup procedures present when dangerous waste, liquid chemicals, or other wastes are delivered.

## Outdoor Liquid Container Storage **SC-31**

- ❑ Prevent operator errors by using engineering safeguards and thus reducing accidental releases of pollutants.



### ***Material Handling and Waste Management***

- ❑ Contain the material in such a manner that if the container leaks or spills, the contents will not discharge, flow, or be washed into the storm drainage system, surface waters or groundwater.
- ❑ Place drip pans or absorbent materials beneath mounted container taps, and at potential drip and spill locations during filling and unloading of containers. Any collected liquids or soiled absorbent materials must be reused/recycled or properly disposed.
- ❑ Ensure that any underground or aboveground storage tanks are designed and managed in accordance with applicable regulations, identified as a potential pollution source, and have secondary containment such as a berm or dike with an impervious surface.
- ❑ Do not pour liquids into floor drains, sinks, outdoor storm drain inlets, or other storm drains or sewer connections.
- ❑ Collect leaking or dripping fluids in drip pans or containers. Fluids are easier to recycle if kept separate.
- ❑ Promptly transfer used fluids to the proper waste or recycling drums. Do not leave drip pans or other open containers lying around.



### ***Employee Training Program***

- ❑ Train employee (e.g., fork lift operators) and contractors in proper spill containment and cleanup. The employee should have the tools and knowledge to immediately begin cleaning up a spill if one should occur.
- ❑ Train employees in proper spill response and prevention, materials handling, and waste management.
- ❑ Use a training log or similar method to document training.



### ***Quality Assurance and Record Keeping***

- ❑ Keep accurate maintenance/inspection logs that document minimum BMP activities performed for liquid container storage and improvement actions.
- ❑ Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.
- ❑ Establish procedures to complete logs and file them in the central office.

### **Other Facility-Specific Considerations**

- ❑ Storage sheds often must meet building and fire code requirements.

## Outdoor Liquid Container Storage SC-31

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- ❑ The local fire district must be consulted for limitations on clearance of roof covers over containers used to store flammable materials.
- ❑ All specific standards set by Federal and State laws concerning the storage of oil and hazardous materials must be met.
- ❑ Storage of reactive, ignitable, or flammable liquids should comply with the Uniform Fire Code and the National Electric Code.
- ❑ Storage of oil and hazardous materials must meet specific Federal and State standards including:
  - ✓ Spill Prevention Control and Countermeasure Plan (SPCC) Plan;
  - ✓ Secondary containment;
  - ✓ Integrity and leak detection monitoring; and
  - ✓ Emergency preparedness plans.

### Potential Capital Facility Costs and Operation & Maintenance Requirements

#### *Facilities*

- ❑ Capital investments such as sheds, covers, dikes, and curbs will likely be required at some sites if adequate cover and containment facilities do not exist and can vary significantly depending upon site conditions.

#### *Maintenance*

- ❑ Most of the operations and maintenance activities associated with implementing this BMP are integrally linked to routine operations as previously described. Therefore additional O&M is not required.
- ❑ Conduct regular inspections and make repairs and improvements as necessary.
- ❑ Conduct regular broom dry-sweeping of area. Do not wash with water.

### Supplemental Information

The most common causes of unintentional releases are:

- ❑ Installation problems;
- ❑ Failure of piping systems (pipes, pumps, flanges, couplings, hoses, and valves);
- ❑ External corrosion and structural failure;
- ❑ Spills and overfills due to operator error; and
- ❑ Leaks during pumping of liquids or gases from truck or rail car to a storage tank or vice versa.

## Outdoor Liquid Container Storage **SC-31**

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### ***Aboveground Tank Leak and Spill Control***

Storage of reactive, ignitable, or flammable liquids should comply with the Uniform Fire Code and the National Electric Code. Practices listed below should be employed to enhance the code requirements:

- ❑ Tanks should be placed in a designated area.
- ❑ Tanks located in areas where firearms are discharged should be encapsulated in concrete or the equivalent.
- ❑ Designated areas should be paved with Portland cement concrete, free of cracks and gaps, and impervious in order to contain leaks and spills.
- ❑ Liquid materials should be stored in UL approved double walled tanks or surrounded by a curb or dike to provide the volume to contain 10% of the volume of the containers or 110% of the volume of the largest container, whichever is greater. The area inside the curb should slope to a drain.
- ❑ For used oil or dangerous waste, a dead-end sump should be installed in the drain.
- ❑ Other liquids should be drained to the sanitary sewer if available. The drain must have a positive control such as a lock, valve, or plug to prevent release of contaminated liquids.
- ❑ Accumulated stormwater in petroleum storage areas should be passed through an oil/water separator.

Maintenance is critical to preventing leaks and spills. Conduct routine weekly inspections and:

- ❑ Check for external corrosion and structural failure.
- ❑ Check for spills and overfills due to operator error.
- ❑ Check for failure of piping system (pipes, pumps, flanger, coupling, hoses, and valves).
- ❑ Check for leaks or spills during pumping of liquids or gases from truck or rail car to a storage facility or vice versa.
- ❑ Inspect new tank or container installation visually for loose fittings, poor welding, and improper or poorly fitted gaskets.
- ❑ Inspect tank foundations, connections, coatings, and tank walls and piping system. Look for corrosion, leaks, cracks, scratches, and other physical damage that may weaken the tank or container system.
- ❑ Frequently release accumulated stormwater during the wet season.
- ❑ Have periodic integrity testing conducted by a qualified professional.



## Outdoor Liquid Container Storage SC-31

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### ***Dikes***

One of the best protective measures against contamination of stormwater is the use of dikes. Containment dikes are berms or retaining walls that are designed to hold spills. Use of dikes is an effective pollution prevention measure for above ground storage tanks and railcar or tank truck loading and unloading areas. The dike surrounds the area of concern and holds the spill, keeping spill materials separated from the stormwater side of the dike area. Diking can be used in any industrial or municipal facility, but it is most commonly used for controlling large spills or releases from liquid storage areas and liquid transfer areas.

- ❑ For single-wall tanks, containment dikes should be large enough to hold the contents of the storage tank for the facility plus rain water.
- ❑ For trucks, diked areas should be capable of holding an amount equal to the volume of the tank truck compartment. Diked construction material should be strong enough to safely hold spilled materials.
- ❑ Dike materials can consist of earth, concrete, synthetic materials, metal, or other impervious materials.
- ❑ Strong acids or bases may react with metal containers, concrete, and some plastics.
- ❑ Where strong acids or bases are stored, alternative dike materials should be considered. More active organic chemicals may need certain special liners for dikes.
- ❑ Dikes may also be designed with impermeable materials to increase containment capabilities.
- ❑ Dikes should be inspected during or after significant storms or spills to check for washouts or overflows.
- ❑ Regular checks of containment dikes to insure the dikes are capable of holding spills should be conducted.
- ❑ Inability of a structure to retain stormwater, dike erosion, soggy areas, or changes in vegetation indicate problems with dike structures. Damaged areas should be patched and stabilized immediately.
- ❑ Earthen dikes may require special maintenance of vegetation such as mulching and irrigation.
- ❑ Remove accumulated stormwater after precipitation events and dispose of according to local regulations.

### ***Curbing***

Curbing is a barrier that surrounds an area of concern. Curbing is similar to containment diking in the way that it prevents spills and leaks from being released into the environment. Curbing is usually small scaled and does not contain large spills to the degree that dikes can. Curbing is common at many facilities in small areas where

## Outdoor Liquid Container Storage SC-31

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handling and transfer of liquid materials occur. Curbing can redirect contaminated stormwater away from the storage area. It is useful in areas where liquid materials are transferred from one container to another. Asphalt is a common material used for curbing; however, curbing materials can include earth, concrete, synthetic materials, metal, or other impenetrable materials.

- ❑ Spilled materials should be removed immediately from curbed areas to allow space for future spills.
- ❑ Curbs should have manually-controlled pump systems rather than common drainage systems for collection of spilled materials.
- ❑ The curbed area should be inspected regularly to clear clogging debris.
- ❑ Maintenance should also be conducted frequently to prevent overflow of any spilled materials as curbed areas are designed only for smaller spills.
- ❑ Remove accumulated stormwater after precipitation events and dispose of according to local regulations.
- ❑ Curbing has the following advantages:
  - ✓ Excellent run-on control;
  - ✓ Inexpensive;
  - ✓ Ease of installment;
  - ✓ Provides option to recycle materials spilled in curb areas; and
  - ✓ Common industry practice.

### References and Resources

Clark County Clean Water Program. 2009. *Clark County Stormwater Pollution Control Manual Best Management Practices for Businesses and Government Agencies, AS A2 & A3*. Available online at:  
<http://www.clark.wa.gov/boards/CleanWater/documents/PollutionControlManual.pdf>.

King County Storm Water Pollution Prevention Manual, 2009 *Commercial Best Management Practice (BMP) Activity Sheets: A-2 Storage of Liquid Materials in Stationary Tanks and A-3 Storage of Liquid Materials in Portable Containers*. Available online at:  
<http://www.kingcounty.gov/environment/waterandland/stormwater/documents/pollution-prevention-manual/commercial-bmp.aspx>.

Orange County Stormwater Program, Best Management Practices for Industrial/Commercial Business Activities. Available online at:  
<http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessesactivities>.

## **Outdoor Liquid Container Storage SC-31**

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US EPA. National Pollutant Discharge Elimination System (NPDES) *Industrial Fact Sheet Series for Activities Covered by EPA's MSGP*. Available online at: <http://cfpub.epa.gov/npdes/stormwater/swsectors.cfm>.

# Outdoor Equipment Operations SC-32

## Description

Outside process equipment operations and maintenance can contaminate stormwater runoff. Activities, such as grinding, painting, coating, sanding, degreasing or parts cleaning, landfills and waste piles, and solid waste treatment and disposal are examples of process operations that can lead to contamination of stormwater runoff. The targeted constituents will vary for each site depending on the operation being performed.

## Approach

Implement source control BMPs to limit exposure of outdoor equipment to direct precipitation and stormwater run-on. Refer to SC-22 Vehicle and Equipment Repair for additional information.

### General Pollution Prevention Protocols

- ☐ Perform the activity during dry periods whenever possible.
- ☐ Install secondary containment measures where leaks and spills may occur.
- ☐ Use non-toxic chemicals for maintenance and minimize or eliminate the use of solvents.
- ☐ Connect process equipment area to public sanitary sewer or facility wastewater treatment system when possible. Some jurisdictions require that secondary containment areas be connected to the sanitary sewer, prohibiting any hard connections to the storm drain.



### Good Housekeeping

- ☐ Manage materials and waste properly (see Material Handling and Waste Management) to reduce adverse impacts on stormwater quality.

## Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize

## Targeted Constituents

<i>Sediment</i>	✓
<i>Nutrients</i>	✓
<i>Trash</i>	✓
<i>Metals</i>	✓
<i>Bacteria</i>	✓
<i>Oil and Grease</i>	✓
<i>Organics</i>	✓

## Minimum BMPs Covered

	<i>Good Housekeeping</i>	✓
	<i>Preventative Maintenance</i>	✓
	<i>Spill and Leak Prevention and Response</i>	✓
	<i>Material Handling &amp; Waste Management</i>	✓
	<i>Erosion and Sediment Controls</i>	
	<i>Employee Training Program</i>	✓
	<i>Quality Assurance Record Keeping</i>	✓



# Outdoor Equipment Operations SC-32

- ❑ Cover the work area with a permanent roof if possible.
- ❑ Use drop cloths for sanding and painting operations.
- ❑ Use a vacuum for fine particle clean-up in pavement cracks and crevices.
- ❑ Minimize contact of stormwater with outside process equipment operations through berming and drainage routing (run-on prevention).
- ❑ "Spot clean" leaks and drips routinely. Leaks are not cleaned up until the absorbent is picked up and disposed of properly.
- ❑ Paint signs on storm drain inlets to indicate that they are not to receive liquid or solid wastes.
- ❑ Use roll down or permanent walls when windy/breezy to prevent wind transport of particulates/pollutants.



## ***Preventative Maintenance***

- ❑ Design outdoor equipment areas to prevent stormwater runoff and spills. Use a perimeter drain or slope pavement inward with drainage to sump.
- ❑ Dry clean the work area regularly. Do not wash outdoor equipment with water if there is a direct connection to the storm drain.
- ❑ Pave area with concrete rather than asphalt.
- ❑ Inspect outdoor equipment regularly for leaks or spills. Also check for structural failure, spills and overfills due to operator error, and/or failure of piping system.
- ❑ Inspect and clean, if necessary, storm drain inlets and catch basins within the outdoor equipment area before October 1 each year.



## ***Spill Response and Prevention Procedures***

- ❑ Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- ❑ Have employees trained in emergency spill cleanup procedures present when dangerous waste, liquid chemicals, or other wastes are delivered.
- ❑ Place a stockpile of spill cleanup materials where it will be readily accessible.
- ❑ Prevent operator errors by using engineering safe guards and thus reducing accidental releases of pollutant.



## ***Material Handling and Waste Management***



## **Outdoor Equipment Operations SC-32**

- ☐ Do not pour liquid wastes into floor drains, sinks, outdoor storm drain inlets, or other storm drain or sewer connections.
- ☐ Collect leaking or dripping fluids in drip pans or containers. Fluids are easier to recycle if kept separate.
- ☐ Promptly transfer used fluids to the proper waste or recycling drums. Do not leave drip pans or other open containers lying around.
- ☐ Minimize the possibility of stormwater pollution from outside waste receptacles by doing at least one of the following:
  - ✓ Use only watertight waste receptacle(s) and keep the lid(s) closed.
  - ✓ Grade and pave the waste receptacle area to prevent run-on of stormwater.
  - ✓ Install a roof over the waste receptacle area.



### ***Employee Training Program***

- ☐ Educate employees about pollution prevention measures and goals.
- ☐ Train employees on proper equipment operation and maintenance procedures.
- ☐ Train all employees upon hiring and annually thereafter on proper methods for handling and disposing of waste. Ensure that all employees understand stormwater discharge prohibitions, wastewater discharge requirements, and these best management practices.
- ☐ Use a training log or similar method to document training.
- ☐ Ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.



### ***Quality Assurance and Record Keeping***

- ☐ Keep accurate maintenance logs that document minimum BMP activities performed for outdoor equipment, types and quantities of materials removed and disposed of, and any improvement actions.
- ☐ Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.
- ☐ Establish procedures to complete logs and file them in the central office.

### **Potential Limitations and Work-Arounds**

Some facilities may have space constraints, limited staffing and time limitations that may preclude implementation of BMPs. Provided below are typical limitations and recommended "work-arounds."

## **Outdoor Equipment Operations SC-32**

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- ❑ Providing cover over outdoor equipment may be impractical or cost-prohibitive.
  - ✓ Operate outdoor equipment only during periods of dry weather.
- ❑ Regular operations and time limitations may require outdoor activities during wet weather.
  - ✓ Designate specific areas for outdoor activities.
  - ✓ Allow time for work area clean-up after each shift.
  - ✓ Require employees to understand and follow preventive maintenance and spill and leak prevention BMPs.
  - ✓ Design and install secondary containment and good housekeeping BMPs for outdoor equipment area.
- ❑ Storage sheds often must meet building and fire code requirements.

### **Potential Capital Facility Costs and Operation & Maintenance Requirements**

#### ***Facilities***

- ❑ Many facilities will already have indoor covered areas where vehicle and equipment repairs take place and will require no additional capital expenditures.
- ❑ If outdoor activities are required, construction of berms or other means to retain spills and leaks may require appropriate constructed systems for containment. These containment areas may require significant new capital investment.
- ❑ Capital investments will likely be required at some sites if adequate cover and containment facilities do not exist and can vary significantly depending upon site conditions.

#### ***Maintenance***

- ❑ Most of the operations and maintenance activities associated with implementing this BMP are integrally linked to routine operations as previously described. Therefore additional O&M is not required.
- ❑ For facilities responsible for pre-treating their wastewater prior to discharging, the proper functioning of structural treatment system is an important maintenance consideration.
- ❑ Routine cleanout of oil and grease is required for the devices to maintain their effectiveness, usually at least once a month. During periods of heavy rainfall, cleanout is required more often to ensure pollutants are not washed through the trap. Sediment removal is also required on a regular basis to keep the device working efficiently.

# **Outdoor Equipment Operations SC-32**

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## **References and Resources**

Minnesota Pollution Control Agency. *Industrial Stormwater Best Management Practices Guidebook BMP 26 Fueling and Liquid Loading/Unloading Operations*. Available online at: <http://www.pca.state.mn.us/index.php/view-document.html?gid=10557>.

New Jersey Department of Environmental Protection, 2013. *Basic Industrial Stormwater General Permit Guidance Document NJPDES General Permit No NJ0088315*. Available online at: [http://www.nj.gov/dep/dwg/pdf/5G2\\_guidance\\_color.pdf](http://www.nj.gov/dep/dwg/pdf/5G2_guidance_color.pdf).

Orange County Stormwater Program, Best Management Practices for Industrial/Commercial Business Activities. Available online at: <http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessesactivities>.

Oregon Department of Environmental Quality, *Industrial Stormwater Best Management Practices Manual- BMP 26 Fueling and Liquid Loading/Unloading Operations*, February 2013. Available online at: <http://www.deq.state.or.us/wq/wqpermit/docs/IndBMP021413.pdf>.

Sacramento Stormwater Management Program. *Best Management Practices for Industrial Storm Water Pollution Control*. Available online at: <http://www.msa.saccounty.net/sactostormwater/documents/guides/industrial-BMP-manual.pdf>.

Sacramento County Environmental Management Stormwater Program: Best Management Practices. Available online at: <http://www.emd.saccounty.net/EnvHealth/Stormwater/Stormwater-BMPs.html>.

Santa Clara Valley Urban Runoff Pollution Prevention Program. <http://www.scvurppp-w2k.com/>

US EPA. National Pollutant Discharge Elimination System – Industrial Fact Sheet Series for Activities Covered by EPA’s Multi Sector General Permit. Available online at: <http://cfpub.epa.gov/npdes/stormwater/swsectors.cfm>.

# Outdoor Storage of Raw Materials SC-33

## Description

Stockpiles of raw materials, by-products, and finished products exposed to rain and/or runoff can pollute stormwater. Stormwater can become contaminated when materials wash off or dissolve into water due to improper storage and containment. To prevent or reduce the discharge of pollutants to stormwater from raw material delivery and storage, pollution prevention and source control measures must be implemented, such as minimizing the storage of hazardous materials on-site, enclosing or covering materials, storing materials in a designated area, installing secondary containment, conducting regular inspections, preventing stormwater run-on and runoff, and training employees and subcontractors. This fact sheet focuses on source control BMPs for stockpiles of solid materials; if the raw material, by-product, or product is a liquid, more information for outside storage of liquids can be found under SC-31 Outdoor Liquid Container Storage.

## Approach

Reduce potential for pollutant discharge through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

## General Pollution Prevention Protocols

- ☐ Emphasize employee education for successful BMP implementation.
- ☐ Store materials that could contaminate stormwater inside or under permanent cover. If this is not feasible, then all outside storage areas should be covered with a roof and bermed or enclosed to prevent stormwater contact.
- ☐ Elevate and tarp solid materials such as beams, metal, etc.
- ☐ Minimize the inventory of raw materials kept outside.

## Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize

## Targeted Constituents

Sediment	✓
Nutrients	✓
Trash	
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

## Minimum BMPs Covered

 Good Housekeeping	✓
 Preventative Maintenance	✓
 Spill and Leak Prevention and Response	✓
 Material Handling & Waste Management	
 Erosion and Sediment Controls	✓
 Employee Training Program	✓
 Quality Assurance Record Keeping	✓



# Outdoor Storage of Raw Materials SC-33

- ❑ Keep an accurate, up-to-date inventory of the materials delivered and stored on-site.
- ❑ Stormwater runoff that could potentially be contaminated by materials stored outdoors should be drained to the sanitary sewer if available. The drain must have a positive control such as a lock, valve, or plug to prevent release of contaminated liquids.



## **Good Housekeeping**

- ❑ If raw materials cannot all be stored inside or under permanent cover, prevent exposure to direct precipitation and stormwater run-on by installing a storm-resistant waterproof covering made of polyethylene, polypropylene or hypalon over all materials stored outside. The covers must be in place at all times when work with the stockpiles is not occurring (Applicable to small stockpiles only).
- ❑ Implement erosion control practices at the perimeter of the facility site and at any catch basins to prevent erosion of the stockpiled material off-site, if the stockpiles are so large that they cannot feasibly be covered and contained.
- ❑ Minimize stormwater run-on by enclosing the area or building a berm around it.
- ❑ Keep storage areas clean and dry.
- ❑ Slope paved areas in a manner that minimizes pooling of water on the site, particularly with materials that may leach pollutants into stormwater and/or groundwater, such as compost, logs, and wood chips. A minimum slope of 1.5% is recommended.
- ❑ Secure drums stored in an area where unauthorized persons may not gain access to prevent accidental spillage, pilferage, or any unauthorized use.
- ❑ Install curbing or berms along the perimeter of the area to prevent the run-on of uncontaminated stormwater from adjacent areas as well as runoff of stormwater from the stockpile areas.
- ❑ Slope the area inside the curb or berm to a drain with sump. The sump should be equipped with an oil and water separator if applicable for materials stored onsite.
- ❑ Do not store materials on top of or directly adjacent to storm drain inlets.
- ❑ Cover wood products treated with chromated copper arsenate, ammoniacal copper zinc arsenate, creosote, or pentachlorophenol with properly secured tarps or store indoors.



## **Preventative Maintenance**

- ❑ Maintain outdoor storage containers in good condition. Replace leaky or otherwise inadequate containers as necessary.
- ❑ Maintain outdoor waterproof covers (e.g., tarps) in good condition and properly secure them to be storm resistant. Replace tarps damaged by UV exposure or wear and tear on a regular basis.



# Outdoor Storage of Raw Materials SC-33

- ☐ Perform routine inspection of storm drains and sumps and regularly remove accumulated materials.
- ☐ Dry clean the work area regularly. Do not wash outdoor material storage areas with water if there is a direct connection to the storm drain.
- ☐ Pave outdoor storage areas for liquids such as solvents with concrete rather than asphalt.
- ☐ Conduct regular inspections of storage areas so that leaks and spills are detected as soon as possible.
- ☐ Routinely inspect berms, curbing, containment, and sediment controls for proper function and repair as necessary.



## ***Spill and Leak Prevention and Response***

- ☐ Keep the facility spill prevention and control plan up-to-date.
- ☐ Place a stockpile of spill cleanup materials, such as brooms, dustpans, and vacuum sweepers (if desired) near the storage area where it will be readily accessible.
- ☐ Have employees trained in spill containment and cleanup present during the loading/unloading of hazardous or otherwise dangerous materials.



## ***Erosion and Sediment Controls***

- ☐ Keep materials covered to prevent erosion of stockpiles. This may not be feasible for large stockpiles.
- ☐ Install sediment controls such as fiber rolls around the perimeter of stockpiles to prevent transport of raw materials to the storm drain.
- ☐ Install drain inlet protection around all inlets to prevent raw materials from entering storm drain.
- ☐ Install sediment controls such as silt fence around the perimeter of the site to prevent transport of raw materials to the storm drain or offsite surface waters.



## ***Employee Training Program***

- ☐ Educate employees about pollution prevention measures and goals.
- ☐ Train employees how to properly store outdoor raw materials using the source control BMPs described above.
- ☐ Use a training log or similar method to document training.
- ☐ Ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.

# Outdoor Storage of Raw Materials SC-33



## **Quality Assurance and Record Keeping**

- ☐ Keep accurate maintenance logs that document minimum BMP activities performed for outdoor storage of raw materials, types and quantities of materials removed and disposed of, and any improvement actions.
- ☐ Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.
- ☐ Establish procedures to complete logs and file them in the central office.

## **Other Facility-Specific Considerations**

- ☐ Storage sheds often must meet building and fire code requirements. Storage of reactive, ignitable, or flammable liquids must comply with the Uniform Fire Code and the National Electric Code.
- ☐ Some municipalities require that secondary containment areas (regardless of size) be connected to the sanitary sewer, prohibiting any hard connections to the storm drain.
- ☐ The local fire district must be consulted for limitations on clearance of roof covers over containers used to store flammable materials.

## **Potential Limitations and Work-Arounds**

Some facilities may have space constraints, limited staffing and time limitations that may preclude implementation of BMPs. Provided below are typical limitations and recommended “work-arounds”

- ☐ Space limitations may preclude storing all materials indoors.
  - ✓ Implement good housekeeping, preventative maintenance, and erosion and sediment controls as described above.

## **Potential Capital Facility Costs and Operation & Maintenance Requirements**

### ***Facilities***

- ☐ Many facilities will already have indoor covered areas where raw materials will be stored and will require no additional capital expenditures.
- ☐ If outdoor storage of materials is required, construction of berms or other means to prevent stormwater run-on and runoff may require appropriate constructed systems for containment. These containment areas may require significant new capital investment.
- ☐ Purchase and installation of erosion and sediment controls will require additional capital investments, and this amount will vary depending on site characteristics.
- ☐ Capital investments will likely be required at some sites if adequate cover and containment facilities do not exist and can vary significantly depending upon site conditions.

# Outdoor Storage of Raw Materials SC-33

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## ***Maintenance***

- ❑ Accurate and up-to-date inventories should be kept of all stored materials.
- ❑ Berms and curbs may require periodic repair and patching.
- ❑ Parking lots or other surfaces near bulk materials storage areas should be swept periodically to remove debris blown or washed from storage areas.
- ❑ Sweep paved storage areas regularly for collection and disposal of loose solid materials, do not hose down the area to a storm drain or conveyance ditch.
- ❑ Erosion and sediment controls require regular inspection and periodic replacement or reinstallation.

## **Supplemental Information**

### ***Raw Material Containment***

Paved areas should be sloped in a manner that minimizes pooling of water on the site, particularly with materials that may leach pollutants into stormwater and/or groundwater, such as compost, logs, and wood chips. A minimum slope of 1.5% is recommended.

- ❑ Curbing or berms should be placed along the perimeter of the area to prevent the run-on of uncontaminated stormwater from adjacent areas as well as runoff of stormwater from stockpile areas.
- ❑ The storm drainage system should be designed to minimize use of catch basins in the interior of the area as they tend to rapidly fill with manufacturing material.

The area should be sloped to drain stormwater to the perimeter where it can be collected or to internal drainage alleyways where material is not stockpiled.

The “doghouse” design has been used to store small liquid containers. The roof and flooring design prevent contact with direct rain or runoff. The doghouse has two solid structural walls and two canvas covered walls. The flooring is wire mesh about secondary containment.

## **References and Resources**

Minnesota Pollution Control Agency, *Industrial Stormwater Best Management Practices Guidebook*. Available online at: <http://www.pca.state.mn.us/index.php/view-document.html?gid=10557>.

New Jersey Department of Environmental Protection, 2013. *Basic Industrial Stormwater General Permit Guidance Document NJPDES General Permit No NJ0088315*. Available online at: [http://www.nj.gov/dep/dwg/pdf/5G2\\_guidance\\_color.pdf](http://www.nj.gov/dep/dwg/pdf/5G2_guidance_color.pdf).

Orange County Stormwater Program, *Best Management Practices for Industrial/Commercial Business Activities*. Available online at: <http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessactivities>

## **Outdoor Storage of Raw Materials SC-33**

Oregon Department of Environmental Quality. 2013. *Industrial Stormwater Best Management Practices Manual*. Available online at:  
<http://www.deq.state.or.us/wq/wqpermit/docs/IndBMP021413.pdf>

Sacramento Stormwater Management Program. *Best Management Practices for Industrial Storm Water Pollution Control*. Available online at:  
<http://www.msa.saccounty.net/sactostormwater/documents/guides/industrial-BMP-manual.pdf>.

Sacramento County Environmental Management Stormwater Program: Best Management Practices. Available online at:  
<http://www.emd.saccounty.net/EnvHealth/Stormwater/Stormwater-BMPs.html>.

Santa Clara Valley Urban Runoff Pollution Prevention Program. <http://www.scvurppp-w2k.com/>.

US EPA. National Pollutant Discharge Elimination System – Industrial Fact Sheet Series for Activities Covered by EPA’s Multi Sector General Permit. Available online at:  
<http://cfpub.epa.gov/npdes/stormwater/swsectors.cfm>.

# Waste Handling & Disposal

# SC-34

## Description

Improper storage and handling of solid wastes can allow toxic compounds, oils and greases, heavy metals, nutrients, suspended solids, and other pollutants to enter stormwater runoff. The discharge of pollutants to stormwater from waste handling and disposal can be prevented and reduced by tracking waste generation, storage, and disposal; reducing waste generation and disposal through source reduction, reuse, and recycling; and preventing run-on and runoff.

## Approach

Reduce potential for pollutant discharge through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

## General Pollution Prevention Protocols

- ❑ Accomplish reduction in the amount of waste generated using the following source controls:
  - ✓ Production planning and sequencing;
  - ✓ Process or equipment modification;
  - ✓ Raw material substitution or elimination;
  - ✓ Loss prevention and housekeeping;
  - ✓ Waste segregation and separation; and
  - ✓ Close loop recycling.
- ❑ Establish a material tracking system to increase awareness about material usage. This may reduce spills and minimize contamination, thus reducing the amount of waste produced.
- ❑ Recycle materials whenever possible.

## Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

## Targeted Constituents

Sediment

Nutrients

Trash

Metals

✓

Bacteria

✓

Oil and Grease

✓

Organics

✓

## Minimum BMPs Covered



Good Housekeeping

✓



Preventative Maintenance

✓



Spill and Leak Prevention and Response

✓



Material Handling & Waste Management

✓



Erosion and Sediment Controls

✓



Employee Training Program

✓



Quality Assurance Record Keeping

✓



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# Waste Handling & Disposal

## SC-34

- ☐ Use the entire product before disposing of the container.
- ☐ To the extent possible, store wastes under cover or indoors after ensuring all safety concerns such as fire hazard and ventilation are addressed.
- ☐ Provide containers for each waste stream at each work station. Allow time after shift to clean area.



### **Good Housekeeping**

- ☐ Cover storage containers with leak proof lids or some other means. If waste is not in containers, cover all waste piles (plastic tarps are acceptable coverage) and prevent stormwater run-on and runoff with a berm. The waste containers or piles must be covered except when in use.
- ☐ Use drip pans or absorbent materials whenever grease containers are emptied by vacuum trucks or other means. Grease cannot be left on the ground. Collected grease must be properly disposed of as garbage.
- ☐ Dispose of rinse and wash water from cleaning waste containers into a sanitary sewer if allowed by the local sewer authority. Do not discharge wash water to the street or storm drain. Clean in a designated wash area that drains to a clarifier.
- ☐ Transfer waste from damaged containers into safe containers.
- ☐ Take special care when loading or unloading wastes to minimize losses. Loading systems can be used to minimize spills and fugitive emission losses such as dust or mist. Vacuum transfer systems can minimize waste loss.
- ☐ Keep the waste management area clean at all times by sweeping and cleaning up spills immediately.
- ☐ Use dry methods when possible (e.g., sweeping, use of absorbents) when cleaning around restaurant/food handling dumpster areas. If water must be used after sweeping/using absorbents, collect water and discharge through grease interceptor to the sewer.
- ☐ Stencil or demarcate storm drains on the facility's property with prohibitive message regarding waste disposal.
- ☐ Cover waste piles with temporary covering material such as reinforced tarpaulin, polyethylene, polyurethane, polypropylene or hypalon.
- ☐ If possible, move the activity indoor after ensuring all safety concerns such as fire hazard and ventilation are addressed.



### **Preventative Maintenance**

- ☐ Prevent stormwater run-on from entering the waste management area by enclosing the area or building a berm around the area.
- ☐ Prevent waste materials from directly contacting rain.

# Waste Handling & Disposal

## SC-34

- ☐ Cover waste piles with temporary covering material such as reinforced tarpaulin, polyethylene, polyurethane, polypropylene or hypalon.
- ☐ Cover the area with a permanent roof if feasible.
- ☐ Cover dumpsters to prevent rain from washing waste out of holes or cracks in the bottom of the dumpster.
- ☐ Check waste containers weekly for leaks and to ensure that lids are on tightly. Replace any that are leaking, corroded, or otherwise deteriorating.
- ☐ Sweep and clean the waste management area regularly. Use dry methods when possible (e.g., sweeping, vacuuming, use of absorbents) when cleaning around restaurant/food handling dumpster areas. If water must be used after sweeping/using absorbents, collect water and discharge through grease interceptor to the sewer.
- ☐ Inspect and replace faulty pumps or hoses regularly to minimize the potential of releases and spills.
- ☐ Repair leaking equipment including valves, lines, seals, or pumps promptly.



### ***Spill Response and Prevention Procedures***

- ☐ Keep your spill prevention and plan up-to-date.
- ☐ Have an emergency plan, equipment and trained personnel ready at all times to deal immediately with major spills.
- ☐ Collect all spilled liquids and properly dispose of them.
- ☐ Store and maintain appropriate spill cleanup materials in a location known to all near the designated wash area.
- ☐ Ensure that vehicles transporting waste have spill prevention equipment that can prevent spills during transport. Spill prevention equipment includes:
  - ✓ Vehicles equipped with baffles for liquid waste; and
  - ✓ Trucks with sealed gates and spill guards for solid waste.



### ***Material Handling and Waste Management***

#### ***Litter Control***

- ☐ Post “No Littering” signs and enforce anti-litter laws.
- ☐ Provide a sufficient number of litter receptacles for the facility.
- ☐ Clean out and cover litter receptacles frequently to prevent spillage.

#### ***Waste Collection***

- ☐ Keep waste collection areas clean.

# Waste Handling & Disposal

# SC-34

- ☐ Inspect solid waste containers for structural damage regularly. Repair or replace damaged containers as necessary.
- ☐ Secure solid waste containers; containers must be closed tightly when not in use.
- ☐ Do not fill waste containers with washout water or any other liquid.
- ☐ Ensure that only appropriate solid wastes are added to the solid waste container. Certain wastes such as hazardous wastes, appliances, fluorescent lamps, pesticides, etc., may not be disposed of in solid waste containers (see chemical/ hazardous waste collection section below).
- ☐ Do not mix wastes; this can cause chemical reactions, make recycling impossible, and complicate disposal. Affix labels to all waste containers.

## *Chemical/Hazardous Wastes*

- ☐ Select designated hazardous waste collection areas on-site.
- ☐ Store hazardous materials and wastes in covered containers and protect them from vandalism.
- ☐ Place hazardous waste containers in secondary containment.
- ☐ Make sure that hazardous waste is collected, removed, and disposed of only at authorized disposal areas.
- ☐ Hazardous waste cannot be reused or recycled; it must be disposed of by a licensed hazardous waste hauler.



## **Employee Training Program**

- ☐ Educate employees about pollution prevention measures and goals.
- ☐ Train employees how to properly handle and dispose of waste using the source control BMPs described above.
- ☐ Train employees and subcontractors in proper hazardous waste management.
- ☐ Use a training log or similar method to document training.
- ☐ Ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.



## **Quality Assurance and Record Keeping**

- ☐ Keep accurate maintenance logs that document minimum BMP activities performed for waste handling and disposal, types and quantities of waste disposed of, and any improvement actions.
- ☐ Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.

# Waste Handling & Disposal

# SC-34

- Establish procedures to complete logs and file them in the central office.

## Potential Capital Facility Costs and Operation & Maintenance Requirements

### Facilities

- Capital costs will vary substantially depending on the size of the facility and the types of waste handled. Significant capital costs may be associated with reducing wastes by modifying processes or implementing closed-loop recycling.
- Many facilities will already have indoor covered areas where waste materials will be stored and will require no additional capital expenditures for providing cover.
- If outdoor storage of wastes is required, construction of berms or other means to prevent stormwater run-on and runoff may require appropriate constructed systems for containment.
- Capital investments will likely be required at some sites if adequate cover and containment facilities do not exist and can vary significantly depending upon site conditions.

### Maintenance

- Check waste containers weekly for leaks and to ensure that lids are on tightly. Replace any that are leaking, corroded, or otherwise deteriorating.
- Sweep and clean the waste management area regularly. Use dry methods when possible (e.g., sweeping, use of absorbents) when cleaning around restaurant/food handling dumpster areas. If water must be used after sweeping/using absorbents, collect water and discharge through grease interceptor to the sewer.
- Inspect and replace faulty pumps or hoses regularly to minimize the potential of releases and spills.
- Repair leaking equipment including valves, lines, seals, or pumps promptly.

## References and Resources

Minnesota Pollution Control Agency, *Industrial Stormwater Best Management Practices Guidebook*. Available online at: <http://www.pca.state.mn.us/index.php/view-document.html?gid=10557>.

New Jersey Department of Environmental Protection, 2013. *Basic Industrial Stormwater General Permit Guidance Document NJPDES General Permit No NJ0088315*, Revised. Available online at: [http://www.nj.gov/dep/dwq/pdf/5G2\\_guidance\\_color.pdf](http://www.nj.gov/dep/dwq/pdf/5G2_guidance_color.pdf).

Orange County Stormwater Program, *Best Management Practices for Industrial/Commercial Business Activities*. Available online at: <http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessesactivities>

## **Waste Handling & Disposal** **SC-34**

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Oregon Department of Environmental Quality, 2013. *Industrial Stormwater Best Management Practices Manual- BMP 26 Fueling and Liquid Loading/Unloading Operations*. Available online at:  
<http://www.deq.state.or.us/wq/wqpermit/docs/IndBMP021413.pdf>.

Sacramento Stormwater Management Program. *Best Management Practices for Industrial Storm Water Pollution Control*. Available online at:  
<http://www.msa.saccounty.net/sactostormwater/documents/guides/industrial-BMP-manual.pdf>.

Sacramento County Environmental Management Stormwater Program: Best Management Practices. Available online at:  
<http://www.emd.saccounty.net/EnvHealth/Stormwater/Stormwater-BMPs.html>.

Santa Clara Valley Urban Runoff Pollution Prevention Program. <http://www.scvurppp-w2k.com/>

US EPA. National Pollutant Discharge Elimination System – Industrial Fact Sheet Series for Activities Covered by EPA’s Multi Sector General Permit. Available online at:  
<http://cfpub.epa.gov/npdes/stormwater/swsectors.cfm>.



# Safer Alternative Products

# SC-35

## Description

Promote the use of less harmful products and products that contain little or no TMDL and 303(d) list pollutants. Alternatives exist for most product classes including chemical fertilizers, pesticides, cleaning solutions, janitorial chemicals, automotive and paint products, and consumables (batteries, fluorescent lamps).

## Approach

Pattern a new program after the many established programs around the state and country. Integrate this best management practice as much as possible with existing programs at your facility.

Develop a comprehensive program based on:

- The "Precautionary Principle," which is an alternative to the "Risk Assessment" model that says it's acceptable to use a potentially harmful product until physical evidence of its harmful effects are established and deemed too costly from an environmental or public health perspective. For instance, a risk assessment approach might say it's acceptable to use a pesticide until there is direct proof of an environmental impact. The Precautionary Principle approach is used to evaluate whether a given product is safe, whether it is really necessary, and whether alternative products would perform just as well.
- Environmentally Preferable Purchasing Program to minimize the purchase of products containing hazardous ingredients used in the facility's custodial services, fleet maintenance, and facility maintenance in favor of using alternate products that pose less risk to employees and to the environment.
- Integrated Pest Management (IPM) or Less-Toxic Pesticide Program, which uses a pest management approach that minimizes the use of toxic chemicals and gets rid of pests

## Objectives

- Educate
- Reduce/Minimize
- Product Substitution

## Targeted Constituents

Sediment	
Nutrients	✓
Trash	
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

## Minimum BMPs Covered

	Good Housekeeping	
	Preventative Maintenance	
	Spill and Leak Prevention and Response	
	Material Handling & Waste Management	
	Erosion and Sediment Controls	
	Employee Training Program	✓
	Quality Assurance Record Keeping	



## Safer Alternative Products

## SC-35

by methods that pose a lower risk to employees, the public, and the environment.

- Energy Efficiency Program including no-cost and low-cost energy conservation and efficiency actions that can reduce both energy consumption and electricity bills, along with long-term energy efficiency investments.

Consider the following mechanisms for developing and implementing a comprehensive program:

- Policies
- Procedures
  - ✓ Standard operating procedures (SOPs);
  - ✓ Purchasing guidelines and procedures; and
  - ✓ Bid packages (services and supplies).
- Materials
  - ✓ Preferred or approved product and supplier lists;
  - ✓ Product and supplier evaluation criteria;
  - ✓ Training sessions and manuals; and
  - ✓ Fact sheets for employees.

Implement this BMP in conjunction with the Vehicle and Equipment Management fact sheets (SC-20 – SC-22) and SC-41 Building and Grounds Maintenance.



### ***Employee Training Program***

- Employees who handle potentially harmful materials should be trained in the use of safer alternatives.
- Purchasing departments should be trained on safer alternative products and encouraged to procure less hazardous materials and products that contain little or no harmful substances or TMDL pollutants.
- Employees and contractors / service providers can both be educated about safer alternatives by using information developed by a number of organizations including the references and resources provided in this fact sheet.

### **Potential Limitations and Work-Arounds**

Some facilities may have space constraints, limited staffing and time limitations that may preclude implementation of BMPs. Provided below are typical limitations and recommended “work-arounds”

- Alternative products may not be available, suitable, or effective in every case.

# Safer Alternative Products

# SC-35

- ✓ Minimize use of hazardous/harmful products if no alternative product is available.

## Regulatory Considerations

This BMP has no regulatory requirements unless local/municipal ordinance applies. Existing regulations already encourage facilities to reduce the use of hazardous materials through incentives such as reduced:

- Specialized equipment storage and handling requirements;
- Storm water runoff sampling requirements;
- Training and licensing requirements; and
- Record keeping and reporting requirements.

## Cost Considerations

- The primary cost is for staff time to: 1) develop new policies and procedures and 2) educate purchasing departments and employees who handle potentially harmful materials about the availability, procurement, and use of safer alternatives.
- Some alternative products may be slightly more expensive than conventional products.

## Supplemental Information

The following discussion provides some general information on safer alternatives. More specific information on particular hazardous materials and the available alternatives may be found in the references and resources listed below.

- Automotive products – Less toxic alternatives are not available for many automotive products, especially engine fluids. But there are alternatives to grease lubricants, car polishes, degreasers, and windshield washer solution. Refined motor oil is also available.
- Vehicle/Trailer lubrication – Fifth wheel bearings on trucks require routine lubrication. Adhesive lubricants are available to replace typical chassis grease.
- Cleaners – Vegetables-based or citrus-based soaps are available to replace petroleum-based soaps/detergents.
- Paint products – Water-based paints, wood preservatives, stains, and finishes with low VOC content are available.
- Pesticides – Specific alternative products or methods exist to control most insects, fungi, and weeds.
- Chemical Fertilizers – Compost and soil amendments are natural alternatives.
- Consumables – Manufacturers have either reduced or are in the process of reducing the amount of heavy metals in consumables such as batteries and fluorescent lamps.

# Safer Alternative Products

# SC-35

All fluorescent lamps contain mercury, however low-mercury containing lamps are now available from most hardware and lighting stores. Fluorescent lamps are also more energy efficient than the average incandescent lamp.

- Janitorial chemicals – Even biodegradable soap can harm fish and wildlife before it biodegrades. Biodegradable does not mean non-toxic. Safer products and procedures are available for floor stripping and cleaning, as well as carpet, glass, metal, and restroom cleaning and disinfecting. Use paper products with post-consumer recycled content and implement electric hand dryers.

## **Examples**

There are a number of business and trade associations, and communities with effective programs. Some of the more prominent are listed below in the references and resources section.

## **References and Resources**

Note: Many of these references provide alternative products for materials that typically are used inside and disposed to the sanitary sewer as well as alternatives to products that usually end up in the storm drain.

### ***General Sustainable Practices and Pollution Prevention Including Pollutant-Specific Information***

California Department of Toxic Substances Control,  
<http://www.dtsc.ca.gov/PollutionPrevention/GreenTechnology/Index.cfm>.

CalRecycle, <http://www.calrecycle.ca.gov/Business/Regulated.htm>.

City of Santa Monica Office of Sustainability and Environment,  
<http://www.smgov.net/departments/ose/>.

City of Palo Alto, <http://www.city.palo-alto.ca.us/cleanbay>.

City and County of San Francisco, Department of the Environment,  
<http://www.sfenvironment.org/toxics-health/greener-business-practices>.

Green Business Program, <http://www.greenbiz.ca.gov/GRlocal.html>.

Product Stewardship Institute, <http://www.productstewardship.us/index.cfm>.

Sacramento Clean Water Business Partners.  
<http://www.sacstormwater.org/CleanWaterBusinessPartners/CleanWaterBusinessPartners.html>.

USEPA. National Pollutant Discharge Elimination System (NPDES) Stormwater Discharges From Industrial Facilities,  
<http://cfpub.epa.gov/npdes/stormwater/indust.cfm>.

USEPA Region IX Pollution Prevention Program,  
<http://www.epa.gov/region9/waste/p2/business.html>.

## Safer Alternative Products

## SC-35

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Western Sustainability and Pollution Prevention Network, <http://wsppn.org/>.

### ***Metals (mercury, copper)***

National Electrical Manufacturers Association – Environmental Stewardship,  
<http://www.nema.org/Policy/Environmental-Stewardship/pages/default.aspx>.

Sustainable Conservation, <http://www.suscon.org>.

Auto Recycling Project

Brake Pad Partnership

### ***Pesticides and Chemical Fertilizers***

Bio-Integral Resource Center, <http://www.birc.org>.

California Department of Pesticide Regulation,  
<http://www.cdpr.ca.gov/dprprograms.htm>.

University of California Statewide IPM Program,  
<http://www.ipm.ucdavis.edu/default.html>.

### ***Dioxins***

Bay Area Dioxins Project,  
[http://www.abag.ca.gov/bavarea/dioxin/project\\_materials.htm](http://www.abag.ca.gov/bavarea/dioxin/project_materials.htm).



# Contaminated or Erodible Areas SC-40

## Description

Areas within an industrial site that are bare of vegetation or are subject to activities that promote the suppression of vegetation are often subject to erosion. In addition, they may or may not be contaminated from past or current activities. If the area is temporarily bare because of construction, see SC-42 Building Repair, Remodeling, and Construction. Sites with excessive erosion or the potential for excessive erosion should consider employing the soil erosion BMPs identified in the Construction BMP Handbook. Note that this fact sheet addresses soils that do not exceed hazardous waste criteria (see Title 22 California Code of Regulations for Hazardous Waste Criteria).

## Approach

Reduce potential for pollutant discharge through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

## General Pollution Prevention Protocols

Implement erosion and sediment control BMPs to stabilize soils and reduce pollutant discharges from contaminated or erodible surfaces.



## Erosion and Sediment Controls

- ☐ Preserve natural vegetation whenever possible. See also EC-2 Preservation of Existing Vegetation, in the Construction BMP Handbook.
- ☐ Analyze soil conditions.
- ☐ Remove contaminated soil and dispose of properly.
- ☐ Stabilize loose soils by re-vegetating whenever possible. See also EC-4 Hydroseeding, in the Construction BMP Handbook.

## Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

## Targeted Constituents

Sediment	✓
Nutrients	✓
Trash	
Metals	✓
Bacteria	✓
Oil and Grease	✓
Organics	✓

## Minimum BMPs Covered

	Good Housekeeping	
	Preventative Maintenance	
	Spill and Leak Prevention and Control	
	Material Handling & Waste Management	
	Erosion and Sediment Controls	✓
	Employee Training Program	✓
	Quality Assurance Record Keeping	✓



## Contaminated or Erodible Areas SC-40

- Utilize non-vegetative stabilization methods for areas prone to erosion where vegetative options are not feasible. Examples include:
  - ✓ Areas of vehicular or pedestrian traffic such as roads or paths;
  - ✓ Arid environments where vegetation would not provide timely ground coverage, or would require excessive irrigation;
  - ✓ Rocky substrate, infertile or droughty soils where vegetation would be difficult to establish; and
  - ✓ Areas where vegetation will not grow adequately within the construction time frame.

There are several non-vegetative stabilization methods and selection should be based on site-specific conditions. See also EC-16 Non-Vegetative Stabilization, in the Construction BMP Handbook.

- Utilize chemical stabilization when needed. See also EC-5 Soil Binders, in the Construction BMP Handbook.
- Use geosynthetic membranes to control erosion if feasible. See also EC-7 Geotextiles and Mats, in the Construction BMP Handbook.
- Stabilize all roadways, entrances, and exits to sufficiently control discharges of erodible materials from discharging or being tracked off the site. See also TC 1-3 Tracking Control, in the Construction BMP Handbook.
- Implement wind erosion control measures as necessary. See also WE-1 Wind Erosion Control, in the Construction BMP Handbook.



### ***Employee Training Program***

- Educate employees about pollution prevention measures and goals.
- Train employees how to properly install and maintain the erosion and sediment source control BMPs described above. Detailed information is provided in the Construction BMP Handbook.
- Use a training log or similar method to document training.



### ***Quality Assurance and Record Keeping***

- Keep accurate logs that document actions taken to maintain and improve the effectiveness of the erosion and sediment control BMPs described above.
- Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.
- Establish procedures to complete logs and file them in the central office.

# Contaminated or Erodible Areas SC-40

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## Potential Capital Facility Costs and Operation & Maintenance Requirements

### *Facilities*

- Many facilities do not have contaminated or erodible areas and will require no additional capital expenditures.
- For sites with contaminated or erodible areas, purchase and installation of erosion and sediment controls will require additional capital investments, and this amount will vary depending on site characteristics and the types of BMPs being implemented.
- Minimize costs by maintaining existing vegetation and limiting site operations on bare soils.

### *Maintenance*

- The erosion and sediment control BMPs described above require periodic inspection and maintenance to remain effective. The cost of these actions will vary depending on site characteristics and the types of BMPs being implemented.
- Irrigation costs may be required to establish and maintain vegetation.

## Supplemental Information

### *Stabilization of Erodible Areas*

Preserving stabilized areas minimizes erosion potential, protects water quality, and provides aesthetic benefits. The most effective way to control erosion is to preserve existing vegetation. Preservation of natural vegetation provides a natural buffer zone and an opportunity for infiltration of stormwater and capture of pollutants in the soil matrix. This practice can be used as a permanent source control measure.

Vegetation preservation should be incorporated into the site. Preservation requires good site management to minimize operations on bare soils where vegetation exists. Proper maintenance is important to ensure healthy vegetation that can control erosion. Different species, soil types, and climatic conditions will require different maintenance activities such as mulching, fertilizing, liming, irrigation, pruning and weed and pest control.

The preferred approach is to leave as much native vegetation on-site as possible, thereby reducing or eliminating any erosion problem. However, assuming the site already has contaminated or erodible surface areas, there are four possible courses of action which can be taken:

- The area can be revegetated if it is not in use and therefore not subject to damage from site activities. In as much as the area is already devoid of vegetation, special measures are likely necessary. Lack of vegetation may be due to the lack of water and/or poor soils. The latter can perhaps be solved with fertilization, or the ground may simply be too compacted from prior use. Improving soil conditions may be sufficient to support the recovery of vegetation. Use process wastewater for irrigation if possible, and see the Construction BMP Handbook for further procedures on establishing vegetation.

## Contaminated or Erodible Areas SC-40

- Watering trucks to prevent dust.
- Chemical stabilization can be used as an alternate method in areas where temporary seeding practices cannot be used because of season or climate. It can provide immediate, effective, and inexpensive erosion control. Application rates and procedures recommended by the manufacturer should be followed as closely as possible to prevent the products from forming ponds and creating large areas where moisture cannot penetrate the soil. See also EC-5, Soil Binders, in the Construction BMP Handbook for more information. Advantages of chemical stabilization include:
  - ✓ Applied easily to the surface;
  - ✓ Stabilizes areas effectively; and
  - ✓ Provides immediate protection to soils that are in danger of erosion.
- Contaminated soils should be cleaned up or removed. This requires determination of the level and extent of the contamination. Removal must comply with State and Federal regulations; permits must be acquired and fees paid.
- Non-vegetated stabilization methods are suitable for permanently protecting from erosion by water and wind. Non-vegetated stabilization should only be utilized when vegetation cannot be established due to soil or climactic conditions, or where vegetation may be a potential fire hazard.

Examples of non-vegetative stabilization BMPs are provided below:

- ✓ **Decomposed Granite (DG) and Gravel Mulch** are suitable for use in areas where vegetation establishment is difficult, on flat surfaces, trails and pathways, and when used in conjunction with a stabilizer or tackifier, on shallow slopes (i.e., 10:1 [H:V]). DG and gravel can also be used on shallow rocky slopes where vegetation cannot be established for permanent erosion control.
- ✓ **Degradable Mulches** can be used to cover and protect soil surfaces from erosion both in temporary and permanent applications. In many cases, the use of mulches by themselves requires routine inspection and re-application. See EC-3 Hydraulic Mulch, EC-6 Straw Mulch, EC-8 Wood Mulch, or EC-14 Compost Blankets of the Construction BMP Handbook for more information.
- ✓ **Geotextiles and Mats** can be used as a temporary stand-alone soil stabilization method. Depending on material selection, geotextiles and mats can be a short-term (3 months – 1 year) or long-term (1-2 years) temporary stabilization method. For more information on geotextiles and mats see EC-7 Geotextiles and Mats of the Construction BMP Handbook.
- ✓ **Rock Slope Protection** can be used when the slopes are subject to scour or have a high erosion potential, such as slopes adjacent to flowing waterways or slopes subject to overflow from detention facilities (spillways).

## **Contaminated or Erodible Areas SC-40**

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- ✓ **Soil Binders** can be used for temporary stabilization of stockpiles and disturbed areas not subject to heavy traffic. See EC-5 Soil Binders for more information. References and Resources.

### **References and Resources**

California Stormwater Quality Association 2012, *Construction Stormwater Best Management Practice Handbook*. Available at <http://www.casqa.org>.

City of Seattle, Seattle Public Utilities Department of Planning and Development, 2009. *Stormwater Manual Vol. 1 Source Control Technical Requirements Manual*.

Orange County Stormwater Program, Best Management Practices for Industrial/Commercial Business Activities. Available online at: <http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessesactivities>.

Sacramento Stormwater Management Program. *Best Management Practices for Industrial Storm Water Pollution Control*. Available online at: <http://www.msa.saccounty.net/sactostormwater/documents/guides/industrial-BMP-manual.pdf>.

Santa Clara Valley Urban Runoff Pollution Prevention Program, <http://www.scvurppp-w2k.com/>.

Tahoe Regional Planning Agency, *Best Management Practices Handbook*, 2012. Available online at: <http://www.tahoebmp.org/Documents/2012%20BMP%20Handbook.pdf>.

The Storm Water Managers Resource Center, <http://www.stormwatercenter.net>.

U.S. Environmental Protection Agency, *Construction Site Stormwater Runoff Control*. Available online at: [http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min\\_measure&min\\_measure\\_id=4](http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min_measure&min_measure_id=4).



# Building & Grounds Maintenance SC-41

## Description

Stormwater runoff from building and grounds maintenance activities can be contaminated with toxic hydrocarbons in solvents, fertilizers and pesticides, suspended solids, heavy metals, abnormal pH, and oils and greases. Utilizing the protocols in this fact sheet will prevent or reduce the discharge of pollutants to stormwater from building and grounds maintenance activities by washing and cleaning up with as little water as possible, following good landscape management practices, preventing and cleaning up spills immediately, keeping debris from entering the storm drains, and maintaining the stormwater collection system.

## Approach

Reduce potential for pollutant discharge through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

## General Pollution Prevention Protocols

- ☐ Switch to non-toxic chemicals for maintenance to the maximum extent possible.
- ☐ Choose cleaning agents that can be recycled.
- ☐ Encourage proper lawn management and landscaping, including use of native vegetation.
- ☐ Encourage use of Integrated Pest Management techniques for pest control.
- ☐ Encourage proper onsite recycling of yard trimmings.
- ☐ Recycle residual paints, solvents, lumber, and other material as much as possible.

## Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

## Targeted Constituents

Sediment	✓
Nutrients	✓
Trash	
Metals	✓
Bacteria	✓
Oil and Grease	
Organics	

## Minimum BMPs Covered

	Good Housekeeping	✓
	Preventative Maintenance	
	Spill and Leak Prevention and Response	✓
	Material Handling & Waste Management	✓
	Erosion and Sediment Controls	
	Employee Training Program	✓
	Quality Assurance Record Keeping	✓



## **Building & Grounds Maintenance SC-41**

- Clean work areas at the end of each work shift using dry cleaning methods such as sweeping and vacuuming.



### ***Good Housekeeping***

#### ***Pressure Washing of Buildings, Rooftops, and Other Large Objects***

- In situations where soaps or detergents are used and the surrounding area is paved, pressure washers must use a water collection device that enables collection of wash water and associated solids. A sump pump, wet vacuum or similarly effective device must be used to collect the runoff and loose materials. The collected runoff and solids must be disposed of properly.
- If soaps or detergents are not used, and the surrounding area is paved, wash runoff does not have to be collected but must be screened. Pressure washers must use filter fabric or some other type of screen on the ground and/or in the catch basin to trap the particles in wash water runoff.
- If you are pressure washing on a grassed area (with or without soap), runoff must be dispersed as sheet flow as much as possible, rather than as a concentrated stream. The wash runoff must remain on the grass and not drain to pavement.

#### ***Landscaping Activities***

- Dispose of grass clippings, leaves, sticks, or other collected vegetation as garbage, or by composting. Do not dispose of collected vegetation into waterways or storm drainage systems.
- Use mulch or other erosion control measures on exposed soils. See also SC-40, Contaminated and Erodible Areas, for more information.

#### ***Building Repair, Remodeling, and Construction***

- Do not dump any toxic substance or liquid waste on the pavement, the ground, or toward a storm drain.
- Use ground or drop cloths underneath outdoor painting, scraping, and sandblasting work, and properly dispose of collected material daily.
- Use a ground cloth or oversized tub for activities such as paint mixing and tool cleaning.
- Clean paintbrushes and tools covered with water-based paints in sinks connected to sanitary sewers or in portable containers that can be dumped into a sanitary sewer drain. Brushes and tools covered with non-water-based paints, finishes, or other materials must be cleaned in a manner that enables collection of used solvents (e.g., paint thinner, turpentine, etc.) for recycling or proper disposal.
- Use a storm drain cover, filter fabric, or similarly effective runoff control mechanism if dust, grit, wash water, or other pollutants may escape the work area and enter a catch basin. This is particularly necessary on rainy days. The containment device(s) must be in place at the beginning of the work day, and accumulated dirty runoff and

## **Building & Grounds Maintenance SC-41**

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solids must be collected and disposed of before removing the containment device(s) at the end of the work day.

- ❑ If you need to de-water an excavation site, you may need to filter the water before discharging to a catch basin or off-site. If directed off-site, you should direct the water through hay bales and filter fabric or use other sediment filters or traps.
- ❑ Store toxic material under cover during precipitation events and when not in use. A cover would include tarps or other temporary cover material.

### *Mowing, Trimming, and Planting*

- ❑ Dispose of leaves, sticks, or other collected vegetation as garbage, by composting or at a permitted landfill. Do not dispose of collected vegetation into waterways or storm drainage systems.
- ❑ Use mulch or other erosion control measures when soils are exposed.
- ❑ Place temporarily stockpiled material away from watercourses and drain inlets, and berm or cover stockpiles to prevent material releases to the storm drain system.
- ❑ Consider an alternative approach when bailing out muddy water: do not put it in the storm drain; pour over landscaped areas.
- ❑ Use hand weeding where practical.

### *Fertilizer and Pesticide Management*

- ❑ Do not use pesticides if rain is expected.
- ❑ Do not mix or prepare pesticides for application near storm drains.
- ❑ Use the minimum amount needed for the job.
- ❑ Calibrate fertilizer distributors to avoid excessive application.
- ❑ Employ techniques to minimize off-target application (e.g., spray drift) of pesticides, including consideration of alternative application techniques.
- ❑ Apply pesticides only when wind speeds are low.
- ❑ Fertilizers should be worked into the soil rather than dumped or broadcast onto the surface.
- ❑ Irrigate slowly to prevent runoff and then only as much as is needed.
- ❑ Clean pavement and sidewalk if fertilizer is spilled on these surfaces before applying irrigation water.

### *Inspection*

- ❑ Inspect irrigation system periodically to ensure that the right amount of water is being applied and that excessive runoff is not occurring. Minimize excess watering and repair leaks in the irrigation system as soon as they are observed.

# Building & Grounds Maintenance SC-41



## ***Spill Response and Prevention Procedures***

- ☐ Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- ☐ Place a stockpile of spill cleanup materials, such as brooms, dustpans, and vacuum sweepers (if desired) near the storage area where it will be readily accessible.
- ☐ Have employees trained in spill containment and cleanup present during the loading/unloading of dangerous wastes, liquid chemicals, or other materials.
- ☐ Familiarize employees with the Spill Prevention Control and Countermeasure Plan.
- ☐ Clean up spills immediately.



## ***Material Handling and Waste Management***

- ☐ Follow all federal, state, and local laws and regulations governing the use, storage, and disposal of fertilizers and pesticides and training of applicators and pest control advisors.
- ☐ Use less toxic pesticides that will do the job when applicable. Avoid use of copper-based pesticides if possible.
- ☐ Dispose of empty pesticide containers according to the instructions on the container label.
- ☐ Use up the pesticides. Rinse containers, and use rinse water as product. Dispose of unused pesticide as hazardous waste.
- ☐ Implement storage requirements for pesticide products with guidance from the local fire department and County Agricultural Commissioner. Provide secondary containment for pesticides.



## ***Employee Training Program***

- ☐ Educate and train employees on pesticide use and in pesticide application techniques to prevent pollution.
- ☐ Train employees and contractors in proper techniques for spill containment and cleanup.
- ☐ Be sure the frequency of training takes into account the complexity of the operations and the needs of individual staff.



## ***Quality Assurance and Record Keeping***

- ☐ Keep accurate logs that document maintenance activities performed and minimum BMP measures implemented.
- ☐ Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.
- ☐ Establish procedures to complete logs and file them in the central office.



# Building & Grounds Maintenance SC-41

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## Potential Capital Facility Costs and Operation & Maintenance Requirements

### *Facilities*

- Additional capital costs are not anticipated for building and grounds maintenance. Implementation of the minimum BMPs described above should be conducted as part of regular site operations.

### *Maintenance*

- Maintenance activities for the BMPs described above will be minimal, and no additional cost is anticipated.

## Supplemental Information

### *Fire Sprinkler Line Flushing*

Site fire sprinkler line flushing may be a source of non-stormwater runoff pollution. The water entering the system is usually potable water, though in some areas it may be non-potable reclaimed wastewater. There are subsequent factors that may drastically reduce the quality of the water in such systems. Black iron pipe is usually used since it is cheaper than potable piping, but it is subject to rusting and results in lower quality water. Initially, the black iron pipe has an oil coating to protect it from rusting between manufacture and installation; this will contaminate the water from the first flush but not from subsequent flushes. Nitrates, poly-phosphates and other corrosion inhibitors, as well as fire suppressants and antifreeze may be added to the sprinkler water system. Water generally remains in the sprinkler system a long time (typically a year) and between flushes may accumulate iron, manganese, lead, copper, nickel, and zinc. The water generally becomes anoxic and contains living and dead bacteria and breakdown products from chlorination. This may result in a significant BOD problem and the water often smells. Consequently dispose fire sprinkler line flush water into the sanitary sewer. Do not allow discharge to storm drain or infiltration due to potential high levels of pollutants in fire sprinkler line water.

## References and Resources

City of Seattle, Seattle Public Utilities Department of Planning and Development, 2009. *Stormwater Manual Vol. 1 Source Control Technical Requirements Manual*.

Kennedy/Jenks Consultants, 2007. *The Truckee Meadows Industrial and Commercial Storm Water Best Management Practices Handbook*. Available online at: [http://www.cityofsparks.us/sites/default/files/assets/documents/env-control/construction/TM-I-C\\_BMP\\_Handbook\\_2-07-final.pdf](http://www.cityofsparks.us/sites/default/files/assets/documents/env-control/construction/TM-I-C_BMP_Handbook_2-07-final.pdf).

Orange County Stormwater Program, Best Management Practices for Industrial/Commercial Business Activities. Available online at: <http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessactivities>.

Sacramento Stormwater Management Program. *Best Management Practices for Industrial Storm Water Pollution Control*. Available online at:



## **Building & Grounds Maintenance SC-41**

<http://www.msa.saccounty.net/sactostormwater/documents/guides/industrial-BMP-manual.pdf>.

US EPA, 1997. *Best Management Practices Handbook for Hazardous Waste Containers*. Available online at: <http://www.epa.gov/region6/6en/h/handbk4.pdf>.

Ventura Countywide Stormwater Management Program Clean Business Fact Sheets. Available online at: [http://www.vcstormwater.org/documents/programs\\_business/building.pdf](http://www.vcstormwater.org/documents/programs_business/building.pdf).

# Building Repair and Construction SC-42

## Description

Site modifications are common, particularly at large industrial sites. The activity may vary from minor and normal building repair to major remodeling, or the construction of new facilities. These activities can generate pollutants including solvents, paints, paint and varnish removers, finishing residues, spent thinners, soap cleaners, kerosene, asphalt and concrete materials, adhesive residues, and old asbestos installation. Protocols in this fact sheet are intended to prevent or reduce the discharge of pollutants to stormwater from building repair, remodeling, and minor construction by using soil erosion controls, enclosing or covering building material storage areas, using good housekeeping practices, using safer alternative products, and training employees.

This fact sheet is intended to be used for minor repairs and construction. If major construction is required, the guidelines in the Construction BMP Handbook should be followed.

## Approach

The BMP approach is to reduce potential for pollutant discharges through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

## General Pollution Prevention Protocols

- ☐ Recycle residual paints, solvents, lumber, and other materials to the maximum extent practicable.
- ☐ Avoid outdoor repairs and construction during periods of wet weather.
- ☐ Use safer alternative products to the maximum extent practicable. See also SC-35 Safer Alternative Products for more information.

## Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

## Targeted Constituents

<i>Sediment</i>	✓
<i>Nutrients</i>	
<i>Trash</i>	✓
<i>Metals</i>	✓
<i>Bacteria</i>	
<i>Oil and Grease</i>	✓
<i>Organics</i>	✓

## Minimum BMPs Covered

	<i>Good Housekeeping</i>	✓
	<i>Preventative Maintenance</i>	
	<i>Spill and Leak Prevention and Response</i>	✓
	<i>Material Handling &amp; Waste Management</i>	✓
	<i>Erosion and Sediment Controls</i>	✓
	<i>Employee Training Program</i>	✓
	<i>Quality Assurance Record Keeping</i>	✓



## Building Repair and Construction SC-42

- ❑ Buy recycled products to the maximum extent practicable.
- ❑ Inform on-site contractors of company policy on these matters and include appropriate provisions in their contract to ensure certain proper housekeeping and disposal practices are implemented.
- ❑ Make sure that nearby storm drains are well marked to minimize the chance of inadvertent disposal of residual paints and other liquids.



### **Good Housekeeping**

#### *Repair & Remodeling*

- ❑ Keep the work site clean and orderly. Remove debris in a timely fashion. Sweep and vacuum the area regularly to remove sediments and small debris.
- ❑ Cover raw materials of particular concern that must be left outside, particularly during the rainy season. See also SC-33 Outdoor Storage of Raw Materials for more information.
- ❑ Use equipment and tools such as bag sanders to reduce accumulation of debris.
- ❑ Limit/prohibit work on windy days; implement roll-down walls or other measures to reduce wind transport of pollutants.
- ❑ Do not dump waste liquids down the storm drain.
- ❑ Dispose of wash water, sweepings, and sediments properly.
- ❑ Store liquid materials properly that are normally used in repair and remodeling such as paints and solvents. See also SC-31 Outdoor Liquid Container Storage for more information.
- ❑ Sweep out rain gutters or wash the gutter and trap the particles at the outlet of the downspout. A sock or geofabric placed over the outlet may effectively trap the materials. If the downspout is tight lined, place a temporary plug at the first convenient point in the storm drain and pump out the water with a vactor truck, and clean the catch basin sump where you placed the plug.
- ❑ Clean the storm drain system in the immediate vicinity of the construction activity after it is completed. See also SC-44 Drainage System Maintenance for more information.

#### *Painting*

- ❑ Enclose painting operations consistent with local air quality regulations and OSHA.
- ❑ Local air pollution regulations may, in many areas of the state, specify painting procedures which if properly carried out are usually sufficient to protect water quality.
- ❑ Develop paint handling procedures for proper use, storage, and disposal of paints.

## **Building Repair and Construction SC-42**

- ☐ Transport paint and materials to and from job sites in containers with secure lids and tied down to the transport vehicle.
- ☐ Test and inspect spray equipment prior to starting to paint. Tighten all hoses and connections and do not overfill paint containers.
- ☐ Mix paint indoors before using so that any spill will not be exposed to rain. Do so even during dry weather because cleanup of a spill will never be 100 percent effective.
- ☐ Transfer and load paint and hot thermoplastic away from storm drain inlets.
- ☐ Do not transfer or load paint near storm drain inlets.
- ☐ Plug nearby storm drain inlets prior to starting painting and remove plugs when job is complete when there is risk of a spill reaching storm drains.
- ☐ Cover nearby storm drain inlets prior to starting work if sand blasting is used to remove paint.
- ☐ Use a ground cloth to collect the chips if painting requires scraping or sand blasting of the existing surface. Dispose of the residue properly.
- ☐ Cover or enclose painting operations properly to avoid drift.
- ☐ Clean the application equipment in a sink that is connected to the sanitary sewer if using water based paints.
- ☐ Capture all cleanup-water and dispose of properly.
- ☐ Dispose of paints containing lead or tributyl tin and considered a hazardous waste properly.
- ☐ Store leftover paints if they are to be kept for the next job properly, or dispose properly.
- ☐ Recycle paint when possible. Dispose of paint at an appropriate household hazardous waste facility.



### ***Spill Response and Prevention Procedures***

- ☐ Keep your spill prevention and control plan up-to-date.
- ☐ Place a stockpile of spill cleanup materials where it will be readily accessible.
- ☐ Clean up spills immediately.
- ☐ Excavate and remove the contaminated (stained) soil if a spill occurs on dirt.



### ***Material Handling and Waste Management***

- ☐ Post "No Littering" signs and enforce anti-litter laws.

## **Building Repair and Construction SC-42**

- ☐ Provide a sufficient number of litter receptacles for the facility.
- ☐ Clean out and cover litter receptacles frequently to prevent spillage.
- ☐ Keep waste collection areas clean.
- ☐ Inspect solid waste containers for structural damage regularly. Repair or replace damaged containers as necessary.
- ☐ Secure solid waste containers; containers must be closed tightly when not in use.
- ☐ Do not fill waste containers with washout water or any other liquid.
- ☐ Ensure that only appropriate solid wastes are added to the solid waste container. Certain wastes such as hazardous wastes, appliances, fluorescent lamps, pesticides, etc., may not be disposed of in solid waste containers (see chemical/ hazardous waste collection section below).
- ☐ Do not mix wastes; this can cause chemical reactions, make recycling impossible, and complicate disposal. Affix labels to all waste containers.
- ☐ Make sure that hazardous waste is collected, removed, and disposed of properly. See also SC-34, Waste Handling and Disposal for more information.



### ***Sediment and Erosion Controls***

- ☐ Limit disturbance to bare soils and preserve natural vegetation whenever possible. See also EC-2, Preservation of Existing Vegetation, in the Construction BMP Handbook.
- ☐ Stabilize loose soils by re-vegetating whenever possible. See also EC-4 Hydroseeding, in the Construction BMP Handbook.
- ☐ Utilize non-vegetative stabilization methods for areas prone to erosion where vegetative options are not feasible. Examples include:
  - ✓ Areas of vehicular or pedestrian traffic such as roads or paths;
  - ✓ Arid environments where vegetation would not provide timely ground coverage, or would require excessive irrigation;
  - ✓ Rocky substrate, infertile or droughty soils where vegetation would be difficult to establish; and
  - ✓ Areas where vegetation will not grow adequately within the construction time frame.

There are several non-vegetative stabilization methods and selection should be based on site-specific conditions. See also EC-16 Non-Vegetative Stabilization, in the Construction BMP Handbook.



## Building Repair and Construction SC-42

- ❑ Utilize chemical stabilization when needed. See also EC-5 Soil Binders, in the Construction BMP Handbook.
- ❑ Use geosynthetic membranes to control erosion if feasible. See also EC-7 Geotextiles and Mats, in the Construction BMP Handbook.
- ❑ Stabilize all roadways, entrances, and exits to sufficiently control discharges of erodible materials from discharging or being tracked off the site. See also TC 1-3 Tracking Control, in the Construction BMP Handbook.
- ❑ Refer to the supplemental information provided below for projects that involve more extensive soil disturbance activities.



### ***Employee Training Program***

- ❑ Educate employees about pollution prevention measures and goals.
- ❑ Train employees how to properly implement the source control BMPs described above. Detailed information for Sediment and Erosion Control BMPs is provided in the Construction BMP Handbook.
- ❑ Proper education of off-site contractors is often overlooked. The conscientious efforts of well trained employees can be lost by unknowing off-site contractors, so make sure they are well informed about pollutant source control responsibilities.
- ❑ Use a training log or similar method to document training.



### ***Quality Assurance and Record Keeping***

- ❑ Keep accurate maintenance logs that document minimum BMP activities performed for building repair and construction, types and quantities of waste disposed of, and any improvement actions.
- ❑ Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.
- ❑ Establish procedures to complete logs and file them in the central office.

### **Potential Limitations and Work-Arounds**

Some facilities may have space constraints, limited staffing and time limitations that may preclude implementation of BMPs. Provided below are typical limitations and recommended “work-arounds.”

- ❑ This BMP is for minor construction only. The State’s General Construction Activity Stormwater Permit has more extensive requirements for larger projects that would disturb one or more acres of surface.
  - ✓ Refer to the companion “Construction Best Management Practice Handbook” which contains specific guidance and best management practices for larger-scale projects.

## **Building Repair and Construction SC-42**

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- ❑ Time constraints may require some outdoor repairs and construction during wet weather.
  - ✓ Require employees to understand and follow good housekeeping and spill and leak prevention BMPs.
  - ✓ Inspect sediment and erosion control BMPs daily during periods of wet weather and repair or improve BMP implementation as necessary.
- ❑ Hazardous waste that cannot be reused or recycled must be disposed of by a licensed hazardous waste hauler.
  - ✓ Minimize use of hazardous materials to the maximum extent practicable.
- ❑ Be certain that actions to help stormwater quality are consistent with Cal- and Fed-OSHA and air quality regulations.
- ❑ Prices for recycled/safer alternative materials and fluids may be higher than those of conventional materials.

### **Potential Capital Facility Costs and Operation & Maintenance Requirements**

#### ***Facilities***

- ❑ Limited capital investments may be required at some sites if adequate cover and containment facilities do not exist for construction materials and wastes.
- ❑ Purchase and installation of erosion and sediment controls, if needed will require additional capital investments, and this amount will vary depending on site characteristics and the types of BMPs being implemented.
- ❑ Minimize costs by maintaining existing vegetation and limiting construction operations on bare soils.

#### ***Maintenance***

- ❑ The erosion and sediment control BMPs described above require periodic inspection and maintenance to remain effective. The cost of these actions will vary depending on site characteristics and the types of BMPs being implemented.
- ❑ Irrigation costs may be required to establish and maintain vegetation.

### **Supplemental Information**

#### ***Soil/Erosion Control***

If the work involves exposing large areas of soil, employ the appropriate soil erosion and control techniques. See the Construction Best Management Practice Handbook. If old buildings are being torn down and not replaced in the near future, stabilize the site using measures described in SC-40 Contaminated or Erodible Areas.

## **Building Repair and Construction SC-42**

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If a building is to be placed over an open area with a storm drainage system, make sure the storm inlets within the building are covered or removed, or the storm line is connected to the sanitary sewer. If because of the remodeling a new drainage system is to be installed or the existing system is to be modified, consider installing catch basins as they serve as effective “in-line” treatment devices. Include in the catch basin a “turn-down” elbow or similar device to trap floatables.

### **References and Resources**

City of Seattle, Seattle Public Utilities Department of Planning and Development, 2009. *Stormwater Manual Vol. 1 Source Control Technical Requirements Manual*.

California Stormwater Quality Association, 2012. *Construction Stormwater Best Management Practice Handbook*. Available at <http://www.casqa.org>.

Kennedy/Jenks Consultants, 2007. *The Truckee Meadows Industrial and Commercial Storm Water Best Management Practices Handbook*. Available online at: [http://www.cityofsparks.us/sites/default/files/assets/documents/env-control/construction/TM-I-C BMP Handbook 2-07-final.pdf](http://www.cityofsparks.us/sites/default/files/assets/documents/env-control/construction/TM-I-C_BMP_Handbook_2-07-final.pdf).

Sacramento Stormwater Management Program. *Best Management Practices for Industrial Storm Water Pollution Control*. Available online at: <http://www.msa.saccounty.net/sactostormwater/documents/guides/industrial-BMP-manual.pdf>.

US EPA. *Construction Site Stormwater Runoff Control*. Available online at: [http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min\\_measure&min\\_measure\\_id=4](http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min_measure&min_measure_id=4).

# Parking Area Maintenance

# SC-43

## Description

Parking lots can contribute a number of substances, such as trash, suspended solids, hydrocarbons, oil and grease, and heavy metals that can enter receiving waters through stormwater runoff or non-stormwater discharges. The protocols in this fact sheet are intended to prevent or reduce the discharge of pollutants from parking areas and include using good housekeeping practices, following appropriate cleaning BMPs, and training employees.

BMPs for other outdoor areas on site (loading/unloading, material storage, and equipment operations) are described in SC-30 through SC-33.

## Approach

The goal of this program is to ensure stormwater pollution prevention practices are considered when conducting activities on or around parking areas to reduce potential for pollutant discharge to receiving waters. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

## General Pollution Prevention Protocols

- ☐ Encourage advanced designs and maintenance strategies for impervious parking lots. Refer to the treatment control BMP fact sheets in this manual for additional information.
- ☐ Keep accurate maintenance logs to evaluate BMP implementation.



## Good Housekeeping

- ☐ Keep all parking areas clean and orderly. Remove debris, litter, and sediments in a timely fashion.
- ☐ Post "No Littering" signs and enforce anti-litter laws.

## Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

## Targeted Constituents

<i>Sediment</i>	✓
<i>Nutrients</i>	
<i>Trash</i>	✓
<i>Metals</i>	✓
<i>Bacteria</i>	
<i>Oil and Grease</i>	✓
<i>Organics</i>	✓

## Minimum BMPs Covered

	<i>Good Housekeeping</i>	✓
	<i>Preventative Maintenance</i>	✓
	<i>Spill and Leak Prevention and Response</i>	✓
	<i>Material Handling &amp; Waste Management</i>	
	<i>Erosion and Sediment Controls</i>	
	<i>Employee Training Program</i>	✓
	<i>Quality Assurance Record Keeping</i>	✓



# Parking Area Maintenance

## SC-43

- ☐ Provide an adequate number of litter receptacles.
- ☐ Clean out and cover litter receptacles frequently to prevent spillage.



### **Preventative Maintenance**

#### *Inspection*

Have designated personnel conduct inspections of parking facilities and stormwater conveyance systems associated with parking facilities on a regular basis.

- ☐ Inspect cleaning equipment/sweepers for leaks on a regular basis.

#### *Surface Cleaning*

- ☐ Use dry cleaning methods (e.g., sweeping, vacuuming) to prevent the discharge of pollutants into the stormwater conveyance system if possible.
- ☐ Establish frequency of public parking lot sweeping based on usage and field observations of waste accumulation.
- ☐ Sweep all parking lots at least once before the onset of the wet season.
- ☐ Dispose of parking lot sweeping debris and dirt at a landfill.
- ☐ Follow the procedures below if water is used to clean surfaces:
  - ✓ Block the storm drain or contain runoff.
  - ✓ Collect and pump wash water to the sanitary sewer or discharge to a pervious surface. Do not allow wash water to enter storm drains.
- ☐ Follow the procedures below when cleaning heavy oily deposits:
  - ✓ Clean oily spots with absorbent materials.
  - ✓ Use a screen or filter fabric over inlet, then wash surfaces.
  - ✓ Do not allow discharges to the storm drain.
  - ✓ Vacuum/pump discharges to a tank or discharge to sanitary sewer.
  - ✓ Dispose of spilled materials and absorbents appropriately.

#### *Surface Repair*

- ☐ Check local ordinance for SUSMP/LID ordinance.
- ☐ Preheat, transfer or load hot bituminous material away from storm drain inlets.
- ☐ Apply concrete, asphalt, and seal coat during dry weather to prevent contamination from contacting stormwater runoff.
- ☐ Cover and seal nearby storm drain inlets where applicable (with waterproof material or mesh) and manholes before applying seal coat, slurry seal, etc. Leave covers in



# Parking Area Maintenance

## SC-43

place until job is complete and all water from emulsified oil sealants has drained or evaporated. Clean any debris from these covered manholes and drains for proper disposal.

- ☐ Use only as much water as necessary for dust control during sweeping to avoid runoff.
- ☐ Catch drips from paving equipment that is not in use with pans or absorbent material placed under the machines. Dispose of collected material and absorbents properly.



### ***Spill Response and Prevention Procedures***

- ☐ Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- ☐ Place a stockpile of spill cleanup materials where it will be readily accessible or at a central location.
- ☐ Clean up fluid spills immediately with absorbent rags or material.
- ☐ Dispose of spilled material and absorbents properly.



### ***Employee Training Program***

- ☐ Provide regular training to field employees and/or contractors regarding cleaning of paved areas and proper operation of equipment.
- ☐ Train employees and contractors in proper techniques for spill containment and cleanup.
- ☐ Use a training log or similar method to document training.



### ***Quality Assurance and Record Keeping***

- ☐ Keep accurate maintenance logs that document minimum BMP activities performed for parking area maintenance, types and quantities of waste disposed of, and any improvement actions.
- ☐ Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.
- ☐ Establish procedures to complete logs and file them in the central office.

## **Potential Capital Facility Costs and Operation & Maintenance Requirements**

### ***Facilities***

- ☐ Capital investments may be required at some sites to purchase sweeping equipment, train sweeper operators, install oil/water/sand separators, or implement advanced BMPs. These costs can vary significantly depending upon site conditions and the amount of BMPs required.

# Parking Area Maintenance SC-43

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## ***Maintenance***

- ❑ Sweep and clean parking lots regularly to minimize pollutant transport into storm drains from stormwater runoff.
- ❑ Clean out oil/water/sand separators regularly, especially after heavy storms.
- ❑ Maintain advanced BMPs such as vegetated swales, infiltration trenches, or detention basins as appropriate. Refer to the treatment control fact sheets for more information.

## **Supplemental Information**

### ***Advanced BMPs***

Some parking areas may require advanced BMPs to further reduce pollutants in stormwater runoff, and a few examples are listed below. Refer to the Treatment Control Fact Sheets and the New Development and Redevelopment Manual for more information.

- ❑ When possible, direct sheet runoff to flow into biofilters (vegetated strip and swale) and/or infiltration devices.
- ❑ Utilize sand filters or oleophilic collectors for oily waste in low quantities.
- ❑ Arrange rooftop drains to prevent drainage directly onto paved surfaces.
- ❑ Design lot to include semi-permeable hardscape.

## **References and Resources**

City of Seattle, Seattle Public Utilities Department of Planning and Development, 2009. *Stormwater Manual Vol. 1 Source Control Technical Requirements Manual*.

California Stormwater Quality Association, 2003. *New Development and Redevelopment Stormwater Best Management Practice Handbook*. Available online at: <https://www.casqa.org/resources/bmp-handbooks/new-development-redevelopment-bmp-handbook>.

Kennedy/Jenks Consultants, 2007. *The Truckee Meadows Industrial and Commercial Storm Water Best Management Practices Handbook*. Available online at: [http://www.cityofsparks.us/sites/default/files/assets/documents/env-control/construction/TM-I-C BMP Handbook 2-07-final.pdf](http://www.cityofsparks.us/sites/default/files/assets/documents/env-control/construction/TM-I-C_BMP_Handbook_2-07-final.pdf).

Orange County Stormwater Program, Best Management Practices for Industrial/Commercial Business Activities. Available online at: <http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessactivities>.

## **Parking Area Maintenance SC-43**

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Pollution from Surface Cleaning Folder, 1996, 2003. Bay Area Stormwater Management Agencies Association. Available online at:

<http://basmaa.org/Portals/0/documents/pdf/Pollution%20from%20Surface%20Cleaning.pdf>.

Sacramento Stormwater Management Program. *Best Management Practices for Industrial Storm Water Pollution Control*. Available online at:

<http://www.msa.saccounty.net/sactostormwater/documents/guides/industrial-BMP-manual.pdf>.

The Storm Water Managers Resource Center, <http://www.stormwatercenter.net>.

US EPA. *Post-Construction Stormwater Management in New Development and Redevelopment*. BMP Fact Sheets. Available online at:

[http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min\\_measure&min\\_measure\\_id=5](http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min_measure&min_measure_id=5).

# Drainage System Maintenance SC-44

## Description

As a consequence of its function, the stormwater drainage facilities on site convey stormwater that may contain certain pollutants either to the offsite conveyance system that collects and transports urban runoff and stormwater, or directly to receiving waters. The protocols in this fact sheet are intended to reduce pollutants leaving the site to the offsite drainage infrastructure or to receiving waters through proper on-site conveyance system operation and maintenance. The targeted constituents will vary depending on site characteristics and operations.

## Approach

Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

### General Pollution Prevention Protocols

- ❑ Maintain catch basins, stormwater inlets, and other stormwater conveyance structures on a regular basis to remove pollutants, reduce high pollutant concentrations during the first flush of storms, prevent clogging of the downstream conveyance system, restore catch basins' sediment trapping capacity, and ensure the system functions properly hydraulically to avoid flooding.
- ❑ Develop and follow a site specific drainage system maintenance plan that describes maintenance locations, methods, required equipment, water sources, sediment collection areas, disposal requirements, and any other pertinent information.



### Good Housekeeping

#### Illicit Connections and Discharges

- ❑ Look for evidence of illegal discharges or illicit connections during routine maintenance of conveyance system and drainage structures:

## Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize

## Targeted Constituents

Sediment	✓
Nutrients	✓
Trash	✓
Metals	✓
Bacteria	✓
Oil and Grease	✓
Organics	✓

## Minimum BMPs Covered

	Good Housekeeping	✓
	Preventative Maintenance	✓
	Spill and Leak Prevention and Response	✓
	Material Handling & Waste Management	
	Erosion and Sediment Controls	
	Employee Training Program	✓
	Quality Assurance Record Keeping	✓



## Drainage System Maintenance **SC-44**

- ✓ Identify evidence of spills such as paints, discoloring, odors, etc.
- ✓ Record locations of apparent illegal discharges/illicit connections.
- ✓ Track flows back to potential discharges and conduct aboveground inspections. This can be done through visual inspection of upgradient manholes or alternate techniques including zinc chloride smoke testing, fluorometric dye testing, physical inspection testing, or television camera inspection.
- ✓ Eliminate the discharge once the origin of flow is established.
- Stencil or demarcate storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as “Dump No Waste Drains to Stream” or similar stenciled next to them to warn against ignorant or intentional dumping of pollutants into the storm drainage system.
- Refer to fact sheet SC-10 Non-Stormwater Discharges for additional information.

### *Illegal Dumping*

- Inspect and clean up hot spots and other storm drainage areas regularly where illegal dumping and disposal occurs.
- Establish a system for tracking incidents. The system should be designed to identify the following:
  - ✓ Illegal dumping hot spots;
  - ✓ Types and quantities (in some cases) of wastes;
  - ✓ Patterns in time of occurrence (time of day/night, month, or year);
  - ✓ Mode of dumping (abandoned containers, “midnight dumping” from moving vehicles, direct dumping of materials, accidents/spills); and
  - ✓ Responsible parties.
- Post “No Dumping” signs in problem areas with a phone number for reporting dumping and disposal. Signs should also indicate fines and penalties for illegal dumping.
- Refer to fact sheet SC-10 Non-Stormwater Discharges for additional information.



### **Preventative Maintenance**

#### *Catch Basins/Inlet Structures*

- Staff should regularly inspect facilities to ensure compliance with the following:
  - ✓ Immediate repair of any deterioration threatening structural integrity.
  - ✓ Cleaning before the sump is 40% full. Catch basins should be cleaned as frequently as needed to meet this standard.



## **Drainage System Maintenance SC-44**

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- ❑ Clean catch basins, storm drain inlets, and other conveyance structures before the wet season to remove sediments and debris accumulated during the summer.
- ❑ Conduct inspections more frequently during the wet season for problem areas where sediment or trash accumulates more often. Prioritize storm drain inlets; clean and repair as needed.
- ❑ Keep accurate logs of the number of catch basins cleaned.
- ❑ Store wastes collected from cleaning activities of the drainage system in appropriate containers or temporary storage sites in a manner that prevents discharge to the storm drain.
- ❑ Dewater the wastes if necessary with outflow into the sanitary sewer if permitted. Water should be treated with an appropriate filtering device prior to discharge to the sanitary sewer. If discharge to the sanitary sewer is not allowed, water should be pumped or vacuumed to a tank and properly disposed. Do not dewater near a storm drain or stream.

### *Storm Drain Conveyance System*

- ❑ Locate reaches of storm drain with deposit problems and develop a flushing schedule that keeps the pipe clear of excessive buildup.
- ❑ Collect and pump flushed effluent to the sanitary sewer for treatment whenever possible.

### *Pump Stations*

- ❑ Clean all storm drain pump stations prior to the wet season to remove silt and trash.
- ❑ Do not allow discharge to reach the storm drain system when cleaning a storm drain pump station or other facility.
- ❑ Conduct routine maintenance at each pump station.
- ❑ Inspect, clean, and repair as necessary all outlet structures prior to the wet season.

### *Open Channel*

- ❑ Modify storm channel characteristics to improve channel hydraulics, increase pollutant removals, and enhance channel/creek aesthetic and habitat value.
- ❑ Conduct channel modification/improvement in accordance with existing laws. Any person, government agency, or public utility proposing an activity that will change the natural state of any river, stream, or lake in California, must enter into a Stream or Lake Alteration Agreement with the Department of Fish and Wildlife. The developer-applicant should also contact local governments (city, county, special districts), other state agencies (SWRCB, RWQCB, Department of Forestry, Department of Water Resources), and Army Corps of Engineers and USFWS.



### **Spill Response and Prevention Procedures**

- ❑ Keep your spill prevention control plan up-to-date.

# Drainage System Maintenance SC-44

- ☐ Investigate all reports of spills, leaks, and/or illegal dumping promptly.
- ☐ Place a stockpile of spill cleanup materials where it will be readily accessible or at a central location.
- ☐ Clean up all spills and leaks using “dry” methods (with absorbent materials and/or rags) or dig up, remove, and properly dispose of contaminated soil.



## ***Employee Training Program***

- ☐ Educate employees about pollution prevention measures and goals.
- ☐ Train employees how to properly handle and dispose of waste using the source control BMPs described above.
- ☐ Train employees and subcontractors in proper hazardous waste management.
- ☐ Use a training log or similar method to document training.
- ☐ Ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.
- ☐ Have staff involved in detection and removal of illicit connections trained in the following:
  - ✓ OSHA-required Health and Safety Training (29 CFR 1910.120) plus annual refresher training (as needed).
  - ✓ OSHA Confined Space Entry training (Cal-OSHA Confined Space, Title 8 and Federal OSHA 29 CFR 1910.146).
  - ✓ Procedural training (field screening, sampling, smoke/dye testing, TV inspection).



## ***Quality Assurance and Record Keeping***

- ☐ Keep accurate maintenance logs that document minimum BMP activities performed for drainage system maintenance, types and quantities of waste disposed of, and any improvement actions.
- ☐ Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.
- ☐ Keep accurate logs of illicit connections, illicit discharges, and illegal dumping into the storm drain system including how wastes were cleaned up and disposed.
- ☐ Establish procedures to complete logs and file them in the central office.

## **Potential Limitations and Work-Arounds**

Provided below are typical limitations and recommended “work-arounds” for drainage system maintenance:

## **Drainage System Maintenance SC-44**

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- Clean-up activities may create a slight disturbance for local aquatic species. Access to items and material on private property may be limited. Trade-offs may exist between channel hydraulics and water quality/riparian habitat. If storm channels or basins are recognized as wetlands, many activities, including maintenance, may be subject to regulation and permitting.
  - ✓ Perform all maintenance onsite and do not flush accumulated material downstream to private property or riparian habitats.
- Storm drain flushing is most effective in small diameter pipes (36-inch diameter pipe or less, depending on water supply and sediment collection capacity). Other considerations associated with storm drain flushing may include the availability of a water source, finding a downstream area to collect sediments, and liquid/sediment disposal.
  - ✓ Develop and follow a site specific drainage system maintenance plan that describes maintenance locations, methods, required equipment, water sources, sediment collection areas, disposal requirements, and any other pertinent information.
- Regulations may include adoption of substantial penalties for illegal dumping and disposal.
  - ✓ Do not dump illegal materials anywhere onsite.
  - ✓ Identify illicit connections, illicit discharge, and illegal dumping.
  - ✓ Cleanup spills immediately and properly dispose of wastes.
- Local municipal codes may include sections prohibiting discharge of soil, debris, refuse, hazardous wastes, and other pollutants into the sanitary sewer system.
  - ✓ Collect all materials and pollutants accumulated in drainage system and dispose of according to local regulations.
  - ✓ Install debris excluders in areas with a trash TMDL.

### **Potential Capital Facility Costs and Operation & Maintenance Requirements**

#### ***Facilities***

- Capital costs will vary substantially depending on the size of the facility and characteristics of the drainage system. Significant capital costs may be associated with purchasing water trucks, vacuum trucks, and any other necessary cleaning equipment or improving the drainage infrastructure to reduce the potential .
- Developing and implementing a site specific drainage system maintenance plan will require additional capital if a similar program is not already in place.

# Drainage System Maintenance SC-44

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## *Maintenance*

- Two-person teams may be required to clean catch basins with vacuor trucks.
- Teams of at least two people plus administrative personnel are required to identify illicit discharges, depending on the complexity of the storm sewer system.
- Arrangements must be made for proper disposal of collected wastes.
- Technical staff are required to detect and investigate illegal dumping violations.
- Methods used for illicit connection detection (smoke testing, dye testing, visual inspection, and flow monitoring) can be costly and time-consuming. Site-specific factors, such as the level of impervious area, the density and ages of buildings, and type of land use will determine the level of investigation necessary.

## **Supplemental Information**

### *Storm Drain Flushing*

Flushing is a common maintenance activity used to improve pipe hydraulics and to remove pollutants in storm drainage systems. Flushing may be designed to hydraulically convey accumulated material to strategic locations, such as an open channel, another point where flushing will be initiated, or the sanitary sewer and the treatment facilities, thus preventing re-suspension and overflow of a portion of the solids during storm events. Flushing prevents “plug flow” discharges of concentrated pollutant loadings and sediments. Deposits can hinder the designed conveyance capacity of the storm drain system and potentially cause backwater conditions in severe cases of clogging.

Storm drain flushing usually takes place along segments of pipe with grades that are too flat to maintain adequate velocity to keep particles in suspension. An upstream manhole is selected to place an inflatable device that temporarily plugs the pipe. Further upstream, water is pumped into the line to create a flushing wave. When the upstream reach of pipe is sufficiently full to cause a flushing wave, the inflated device is rapidly deflated with the assistance of a vacuum pump, thereby releasing the backed up water and resulting in the cleaning of the storm drain segment.

To further reduce impacts of stormwater pollution, a second inflatable device placed well downstream may be used to recollect the water after the force of the flushing wave has dissipated. A pump may then be used to transfer the water and accumulated material to the sanitary sewer for treatment. In some cases, an interceptor structure may be more practical or required to recollect the flushed waters.

It has been found that cleansing efficiency of periodic flush waves is dependent upon flush volume, flush discharge rate, sewer slope, sewer length, sewer flow rate, sewer diameter, and population density. As a rule of thumb, the length of line to be flushed should not exceed 700 feet. At this maximum recommended length, the percent removal efficiency ranges between 65-75% for organics and 55-65% for dry weather grit/inorganic material. The percent removal efficiency drops rapidly beyond that. Water is commonly supplied by a water truck, but fire hydrants can also supply water. To make the best use of water, it is recommended that reclaimed water be used if allowed or that fire hydrant line flushing coincide with storm sewer flushing.

# **Drainage System Maintenance SC-44**

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## **References and Resources**

City of Seattle, Seattle Public Utilities Department of Planning and Development, 2009. *Stormwater Manual Vol. 1 Source Control Technical Requirements Manual*.

Knox County Tennessee *Stormwater Management Manual* Chapter 5 Drainage System Maintenance, 2008. Available online at:  
[http://www.knoxcounty.org/stormwater/manual/Volume%201/knoxco\\_swmm\\_v1\\_chap5\\_jan2008.pdf](http://www.knoxcounty.org/stormwater/manual/Volume%201/knoxco_swmm_v1_chap5_jan2008.pdf).

US EPA. Storm Drain System Cleaning, 2012. Available online at:  
<http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=browse&Button=detail&bmp=102>.



# Infiltration Trench

# TC-10

## General Description

An infiltration trench is a gravel-filled trench that receives stormwater runoff. Runoff is stored in the void space between the stones and infiltrates through the bottom and sides of the trench into the soil matrix. Infiltration trenches promote stormwater infiltration, reduce discharge of stormwater to receiving waters and provide pollutant removal. Pretreatment using buffer strips, swales, or detention basins is important for limiting amounts of sediment, oil & grease, and trash and debris entering the trench which can clog and render the trench ineffective.

## Inspection/Maintenance Considerations

Frequency of clogging is dependent on effectiveness of pretreatment, such as vegetated buffer strips (see TC-31), vegetated swales (see TC-30), and detention basins (see TC-22) at removing sediments. Generally, clogging is occurring if the trench shows signs of long surface ponding. Clogging often occurs within the surface layer and removing and replacing the top 2-3 inches of the surface media may improve performance. If the clogging is subsurface, as determined by observing an inspection well, then completely removing the media and rehabbing the trench is needed. Clogged infiltration trenches with surface standing water can become a nuisance due to mosquito breeding. Maintenance efforts associated with infiltration trenches should include frequent inspections to ensure that water infiltrates into the subsurface completely at a recommended infiltration rate of 96 hours or less to prevent creating mosquito and other vector habitats.

## Advanced BMPs Covered



## Maintenance Concerns

- Accumulation of metals
- Clogged soil or outlet structures
- Vegetation/landscape maintenance

## Targeted Constituents

Sediment	■*
Nutrients	■
Trash	■*
Metals	■
Bacteria	■
Oil and Grease	■*
Organics	■

## Legend (Removal Effectiveness)

- Low ■ High ▲ Medium
- \* Requires Pretreatment

*Note: The removal effectiveness ratings shown in the table are for properly designed, sited, and maintained BMPs; some configurations will have variations in pollutant effectiveness.*



# Infiltration Trench

# TC-10

Inspection Activities	Suggested Frequency
<ul style="list-style-type: none"> <li>□ Inspect after major storms for the first few months to ensure proper functioning. Drain times should be observed to confirm that the designed drain time has been achieved.</li> <li>□ Inspect for upslope or adjacent contributing sediment sources and ensure that pretreatment systems are in place.</li> </ul>	After construction and semi-annually (beginning and end of rainy season)
<ul style="list-style-type: none"> <li>□ Inspect facility for signs of wetness or damage to structures, signs of petroleum hydrocarbon contamination, standing water, trash and debris, sediment accumulation, slope stability, standing water, and material buildup.</li> <li>□ Check for standing water or, if available, check observation wells following 3 days of dry weather to ensure proper drain time.</li> <li>□ Inspect pretreatment devices and diversion structures for damage, sediment buildup, and structural damage.</li> </ul>	Semi-annual and after major storm events
<ul style="list-style-type: none"> <li>□ Trenches with filter fabric should be inspected for sediment deposits by removing a small section of the top layer. If inspection indicates that the trench is partially or completely clogged, it should be restored to its design condition.</li> </ul>	Annual
Maintenance Activities	Suggested Frequency
<ul style="list-style-type: none"> <li>□ Repair undercut and eroded areas at inflow and outflow structures.</li> <li>□ Remove sediment, debris, and oil/grease from pretreatment devices, forebays, inlet/outlet structures, overflow spillway, and trenches as necessary.</li> </ul>	Standard maintenance (as needed)
<ul style="list-style-type: none"> <li>□ Remove trash, debris, grass clippings, trees, and other large vegetation from the trench perimeter and dispose of properly.</li> <li>□ Mow and trim vegetation to prevent establishment of woody vegetation, and for aesthetic and vector reasons.</li> </ul>	Semi-annual, more often as needed
<ul style="list-style-type: none"> <li>□ Remove accumulated sediment from the surface of the trench. Replace first layer of aggregate and filter fabric if clogging appears only to be at the surface.</li> <li>□ Clean trench when loss of infiltrative capacity is observed. If drawdown time is observed to have increased significantly over the design drawdown time, removal of sediment may be necessary. This is an expensive maintenance activity and the need for it can be minimized through prevention of upstream erosion.</li> </ul>	Annual
<ul style="list-style-type: none"> <li>□ Monitor ongoing effectiveness and determine if another BMP type or additional pretreatment could improve long-term performance. A qualified designer with knowledge of local soils and BMP design should be consulted in order to make this determination.</li> </ul>	Every 5 years

# Infiltration Trench

# TC-10

<ul style="list-style-type: none"> <li>❑ Total rehabilitation of the trench should be conducted to maintain storage capacity within 2/3 of the design treatment volume and 96-hour exfiltration rate limit.</li> <li>❑ Rehabilitation of the trench should be performed under the direction of a qualified designer with knowledge of local soils and BMP design. General steps for trench rehabilitation include:               <ul style="list-style-type: none"> <li>✓ Trench walls should be excavated to expose clean soil.</li> <li>✓ All of the stone aggregate must be removed. Filter fabric may need to be removed from the sides and bottom</li> <li>✓ Accumulated sediment should be stripped from the trench bottom. At this point the bottom may be scarified or tilled to help induce infiltration. New fabric and clean stone aggregate should be refilled.</li> </ul> </li> </ul>	<p>Upon reaching target thresholds</p>
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Most of the maintenance should be concentrated on the pretreatment practices, such as buffer strips and swales upstream of the trench to limit the amount of sediment that reaches the infiltration trench. Regular inspection should determine if the sediment removal structures require routine maintenance. Infiltration trenches should not be put into operation until the upstream tributary area is stabilized.

## Additional Information

Infiltration practices have historically had a high rate of failure compared to other stormwater management practices. One study conducted in Prince George's County, Maryland (Galli, 1992), revealed that less than half of the infiltration trenches investigated (of about 50) were still functioning properly, and less than one-third still functioned properly after 5 years. Many of these practices, however, did not incorporate advanced pretreatment. By carefully selecting the location and improving the design features of infiltration practices, their performance should improve.

It is absolutely critical that settleable particles and floatable materials be removed from runoff water before it enters the infiltration trench. The trench will clog and become nonfunctional if excessive particulate matter is allowed to enter the trench.

Special considerations are required for infiltration trenches to be effective in cold climates – refer to the Stormwater Managers Resource Center for more information.

## References

California Department of Transportation. *Treatment BMP Technology Report (CTSW-RT-09-239.06)*, 2010. Available online at: <http://www.dot.ca.gov/hq/env/stormwater/pdf/CTSW-RT-09-239-06.pdf>.

California Stormwater Quality Association. *Stormwater Best Management Practice Handbook, New Development and Redevelopment*, 2003. Available online at: <https://www.casqa.org/resources/bmp-handbooks/new-development-redevelopment-bmp-handbook>.

# Infiltration Trench

# TC-10

City of Los Angeles. “*Development Best Management Practices Handbook, Part B Planning Activities, 4<sup>th</sup> edition*, 2011. Available online at:  
[http://www.lastormwater.org/wp-content/files\\_mf/lidhandbookfinal62212.pdf](http://www.lastormwater.org/wp-content/files_mf/lidhandbookfinal62212.pdf).

Galli, J., 1992. *Analysis of Urban BMP Performance and Longevity in Prince George's County, Maryland*. Metropolitan Washington Council of Governments, Washington, D.C.

Minnesota Pollution Control Agency. Operation and Maintenance of Infiltration Trench, 2013. Available online at:  
[http://stormwater.pca.state.mn.us/index.php/Operation\\_and\\_maintenance\\_of\\_Infiltration\\_trench](http://stormwater.pca.state.mn.us/index.php/Operation_and_maintenance_of_Infiltration_trench).

Riverside County Flood Control and Water Conservation District. *Riverside County Design Handbook for Low Impact Development Best Management Practices*, 2011, Available online at:  
[http://rcflood.org/downloads/NPDES/Documents/LIDManual/LID\\_BMP\\_Design\\_Handbook.pdf](http://rcflood.org/downloads/NPDES/Documents/LIDManual/LID_BMP_Design_Handbook.pdf).

San Francisco Public Utilities Commission, et al. San Francisco Stormwater Design Guidelines. Appendix A, Stormwater BMP Fact Sheets, 2010. Available online at:  
<http://www.sfwater.org/modules/showdocument.aspx?documentid=2778>.

Stormwater Managers Resource Center. Available online at:  
<http://www.stormwatercenter.net>.

Stormwater Mangers Resource Center, Stormwater Practices for Cold Climates. Available online at: <http://www.stormwatercenter.net/Cold%20Climates/cold-climates.htm>.

Tahoe Regional Planning Agency. Best Management Practices Handbook, 2012.  
<http://www.tahoebmp.org/Documents/2012%20BMP%20Handbook.pdf>.

U.S. Environmental Protection Agency, Post-Construction Stormwater Management in New Development and Redevelopment, BMP Fact Sheets. Available online at:  
[http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min\\_measure&min\\_measure\\_id=5](http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min_measure&min_measure_id=5).

Ventura Countywide Stormwater Quality Management Program. *Technical Guidance Manual for Stormwater Quality Control Measures*, 2010. Available online at:  
[http://www.vcstormwater.org/documents/workproducts/technicalguidancemanual/2010revisions/Ventura%20Technical%20Guidance%20Document\\_5-6-10.pdf](http://www.vcstormwater.org/documents/workproducts/technicalguidancemanual/2010revisions/Ventura%20Technical%20Guidance%20Document_5-6-10.pdf).

Watershed Management Institute, Inc. *Operation, Maintenance, and Management of Stormwater Management Systems*. August, 1997. Available online at:  
<http://www.stormwater.ucf.edu/research/stormwaterOMM/stormwateromm.pdf>.



# Infiltration Basin

# TC-11

## General Description

An infiltration basin is a shallow impoundment that is designed to infiltrate stormwater. Infiltration basins store stormwater runoff until it gradually exfiltrates into the underlying soil. Pollutant removal occurs through the infiltration of runoff and the adsorption of pollutants into the soil and vegetation. Additional benefits include:

- Reduced runoff volume and attenuation of peak flows, and
- Facilitated groundwater recharge thus helping to maintain low flows in stream systems.

## Inspection/Maintenance Considerations

The use and regular maintenance of pretreatment BMPs will significantly minimize maintenance requirements for the basin. Installing vegetated swales or a sediment forebay upstream from the infiltration basin can provide effective pretreatment and reduce maintenance.

Spill response procedures and controls should be implemented to prevent spills from reaching the infiltration system. This BMP may require groundwater monitoring, and basins cannot be put into operation until the upstream tributary area is stabilized.

## Advanced BMPs Covered



## Maintenance Concerns

- *Vector Control*
- *Clogged soil or outlet structures*
- *Vegetation/Landscape Maintenance*
- *Groundwater contamination*
- *Accumulation of metals*
- *Aesthetics*

## Targeted Constituents

<i>Sediment</i>	■
<i>Nutrients</i>	■
<i>Trash</i>	■
<i>Metals</i>	■
<i>Bacteria</i>	■
<i>Oil and Grease</i>	■
<i>Organics</i>	■

## Legend (Removal Effectiveness)

- Low ▲ Medium ■ High
- ✱ Requires Pretreatment

*Note: The removal effectiveness ratings shown in the table are for properly designed, sited, and maintained BMPs; some configurations will have variations in pollutant effectiveness.*





# Infiltration Basin

# TC-11

Inspection Activities	Suggested Frequency
<input type="checkbox"/> Observe drain time for a storm after completion or modification of the facility to confirm that the desired drain time has been obtained. <input type="checkbox"/> Newly established vegetation should be inspected several times to determine if any landscape maintenance (reseeding, irrigation, etc.) is necessary. <input type="checkbox"/> Inspect for upslope or adjacent contributing sediment sources and ensure that pretreatment systems are in place.	Post construction and semi-annually (beginning and end of rainy season)
<input type="checkbox"/> Inspect for the following issues: differential accumulation of sediment, signs of wetness or damage to structures, erosion of the basin floor, dead or dying grass on the bottom, condition of riprap, drain time, signs of petroleum hydrocarbon contamination, standing water, trash and debris, sediment accumulation, slope stability, pretreatment device condition	Semi-annually and after extreme events
Maintenance Activities	Suggested Frequency
<input type="checkbox"/> Factors responsible for clogging should be repaired immediately.	Immediately
<input type="checkbox"/> Remove invasive weeds once monthly during the first two growing seasons.	Monthly during growing season
<input type="checkbox"/> Stabilize eroded banks with erosion control mat or mulch and revegetate. <input type="checkbox"/> Repair undercut and eroded areas at inflow and outflow structures. <input type="checkbox"/> Maintain access to the basin for regular maintenance activities. <input type="checkbox"/> Mow as appropriate for vegetative cover species. <input type="checkbox"/> Monitor health of vegetation and replace as necessary. <input type="checkbox"/> Control mosquitoes as necessary. <input type="checkbox"/> Remove litter and debris from infiltration basin area as required. <input type="checkbox"/> Trim vegetation to prevent establishment of woody vegetation that decreases storage volume.	Standard maintenance (as needed)
<input type="checkbox"/> Mow and remove grass clippings, litter, and debris. <input type="checkbox"/> Replant eroded or barren spots to prevent erosion and accumulation of sediment.	Semi-annual
<input type="checkbox"/> Scrape bottom and remove sediment when accumulated sediment reduces original infiltration rate by 25-50%. Restore original cross-section and infiltration rate. Properly dispose of sediment. <input type="checkbox"/> Seed or sod to restore ground cover. <input type="checkbox"/> Disc or otherwise aerate bottom. <input type="checkbox"/> Dethatch basin bottom.	3-5 year maintenance

If there are actual signs of clogging or significant loss of infiltrative capacity the following maintenance activities should be considered:

- ☐ Mechanically de-thatching and/or aerating the top soils along the sides and bottom of the basin.
- ☐ Tilling or dicing to scarify the bottom of the basin

# Infiltration Basin

# TC-11

These activities should be on an “as-needed” rather than on a routine basis. Always remove deposited sediments before scarification, and use a hand-guided rotary tiller, if possible, or a disc harrow pulled by a light tractor.

Clogged infiltration basins with surface standing water can become a breeding area for mosquitoes and midges. Maintenance efforts associated with infiltration basins should include frequent inspections to ensure that water infiltrates into the subsurface completely (recommended infiltration rate of 96 hours or less) and that vegetation is carefully managed to prevent creating mosquito and other vector habitats.

## Additional Information

In most cases, surface sediment removed from an infiltration basin during periodic maintenance to restore capacity does not contain toxic materials (e/g metals, oil and grease, or organics) at levels posing a hazardous concern. Studies to date indicate that pond sediments are generally below toxicity limits and can be safely landfilled or disposed onsite. Onsite sediment disposal is always preferable (if local authorities permit) as long as the sediments are deposited away from the perimeter to prevent their reentry into the basin. Sediments should be tested for toxic materials in compliance with current landfill requirements and disposed of properly.

Maintenance activities should use lightweight equipment (e.g. bobcat), which will not compact the underlying soil to remove the top layer of sediment. The remaining soil should be tilled and revegetated as soon as possible.

Sediment removal within the basin should be performed when the sediment is dry enough so that it is cracked and readily separates from the basin floor. This minimizes intermixing of the finer sediment with underlying coarser material on the basin floor.

Special maintenance considerations are required maintain infiltration basins effectiveness in cold climates. Treating runoff containing salt-based deicers in an infiltration basin may reduce soil fertility cause vegetation to fail. Incorporating mulch into the soil can help to mitigate this problem. Infiltration basins should not be used to store snow plowed from highways or parking lots. The sand in this snow can clog the basin. In addition, the chlorides and other pollutants can contaminate the groundwater.

## References

California Department of Transportation. *Treatment BMP Technology Report (CTSW-RT-09-239.06)*, 2010. Available online at: <http://www.dot.ca.gov/hq/env/stormwater/pdf/CTSW-RT-09-239-06.pdf>.

California Stormwater Quality Association. *Stormwater Best Management Practice Handbook, New Development and Redevelopment*, 2003. Available online at: <https://www.casqa.org/resources/bmp-handbooks/new-development-redevelopment-bmp-handbook>.

# Infiltration Basin

# TC-11

Riverside County Flood Control and Water Conservation District. *Riverside County Design Handbook for Low Impact Development Best Management Practices*, 2011.

Available online at:

[http://rcflood.org/downloads/NPDES/Documents/LIDManual/LID BMP Design Handbook.pdf](http://rcflood.org/downloads/NPDES/Documents/LIDManual/LID_BMP_Design_Handbook.pdf).

San Francisco Public Utilities Commission, et al. *San Francisco Stormwater Design Guidelines*. Appendix A, Stormwater BMP Fact Sheets, 2010. Available online at:

<http://www.sfwater.org/modules/showdocument.aspx?documentid=2778>.

Stormwater Managers Resource Center. <http://www.stormwatercenter.net>.

Stormwater Mangers Resource Center, Stormwater Practices for Cold Climates.

<http://www.stormwatercenter.net/Cold%20Climates/cold-climates.htm>.

Tahoe Regional Planning Agency. *Best Management Practices Handbook*, 2012.

Available online at:

<http://www.tahoebmp.org/Documents/2012%20BMP%20Handbook.pdf>.

U.S. Environmental Protection Agency, Post-Construction Stormwater Management in New Development and Redevelopment. BMP Fact Sheets. Available online

at:[http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min\\_measure&min\\_measure\\_id=5](http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min_measure&min_measure_id=5).

Ventura Countywide Stormwater Quality Management Program. *Technical Guidance Manual for Stormwater Quality Control Measures*, 2010. Available online

at:[http://www.vcstormwater.org/documents/workproducts/technicalguidancemanual/2010revisions/Ventura%20Technical%20Guidance%20Document\\_5-6-10.pdf](http://www.vcstormwater.org/documents/workproducts/technicalguidancemanual/2010revisions/Ventura%20Technical%20Guidance%20Document_5-6-10.pdf).

Watershed Management Institute, Inc. *Operation, Maintenance, and Management of Stormwater Management Systems*, 1997. Available online at:

<http://www.stormwater.ucf.edu/research/stormwaterOMM/stormwateromm.pdf>.

# Vegetated Swale

# TC-30

## General Description

Vegetated swales (also referred to as bioswales, biofiltration swales, or landscaped swales) are open, shallow channels with vegetation covering the side slopes and bottom that collect and slowly convey runoff flow to downstream discharge points. They are designed to treat runoff through filtering by the vegetation in the channel, filtering through a subsoil matrix, and/or infiltration into the underlying soils. Swales can be natural or manmade. They trap particulate pollutants (suspended solids and trace metals), promote infiltration, reduce flow velocity, and increase time of concentration of stormwater runoff. Vegetated swales can be implemented to provide effective pretreatment for detention and infiltration stormwater BMPs.

Vegetated swales can serve as part of a stormwater drainage system and can replace curbs, gutters and storm sewer systems. Therefore, swales are best suited for small landscaped portions of industrial or commercial facilities with low peak flow rates. They are not well suited to treat stormwater runoff from industrial areas that have insufficient source control BMPs.

## Inspection/Maintenance Considerations

A thick vegetative cover is needed for vegetated swales to function properly. Usually, swales require little more than normal landscape maintenance activities such as irrigation and mowing to maintain pollutant removal efficiency. Swales can become a nuisance due to mosquito breeding in standing water if obstructions develop (e.g., debris accumulation, invasive vegetation) and/or if proper drainage slopes are not implemented and maintained. The application of fertilizers and pesticides should be minimized.

## Advanced BMPs Covered



## Maintenance Concerns

- Channelization
- Vegetation/Landscape Maintenance
- Vector Control
- Aesthetics
- Flow Obstructions

## Targeted Constituents

Sediment	▲
Nutrients	●
Trash	●
Metals	▲
Bacteria	●
Oil and Grease	▲
Organics	▲

## Legend (Removal Effectiveness)

● Low ■ High ▲ Medium

\* Requires Pretreatment

*Note: The removal effectiveness ratings shown in the table are for properly designed, sited, and maintained BMPs; some configurations will have variations in pollutant effectiveness.*





# Vegetated Swale

# TC-30

Inspection Activities	Suggested Frequency
<input type="checkbox"/> Inspect after seeding and after first major storms for any damages.	Post construction
<input type="checkbox"/> Inspect for signs of erosion, damage to vegetation, channelization of flow, debris and litter, and areas of sediment accumulation. Perform inspections at the beginning and end of the wet season. Additional inspections after periods of heavy runoff are desirable.	Semi-annual
<input type="checkbox"/> Inspect level spreader for clogging, grass alongside slopes for erosion and formation of rills or gullies, and sand/soil bed for erosion problems.	Annual
Maintenance Activities	Suggested Frequency
<input type="checkbox"/> Mow grass to maintain a height of 3–4 inches, for safety, aesthetic, or other purposes. Litter should always be removed prior to mowing. Clippings should be composted. <input type="checkbox"/> Irrigate swale during dry season (April through October) or when necessary to maintain the vegetation. <input type="checkbox"/> Provide weed control, if necessary to control invasive species.	As needed (frequent, seasonally)
<input type="checkbox"/> Remove litter, branches, rocks blockages, and other debris and dispose of properly. <input type="checkbox"/> Maintain inlet flow spreader (if applicable). <input type="checkbox"/> Repair any damaged areas within a channel identified during inspections. Erosion rills or gullies should be corrected as needed. Bare areas should be replanted as necessary.	Semi-annual
<input type="checkbox"/> Declog the pea gravel diaphragm, if necessary. <input type="checkbox"/> Correct erosion problems in the sand/soil bed of dry swales. <input type="checkbox"/> Plant an alternative grass species if the original grass cover has not been successfully established. Reseed and apply mulch to damaged areas.	Annual (as needed)
<input type="checkbox"/> Remove all accumulated sediment that may obstruct flow through the swale. Sediment accumulating near culverts and in channels should be removed when it builds up to 3 in. at any spot, or covers vegetation, or once it has accumulated to 10% of the original design volume. Replace the grass areas damaged in the process. <input type="checkbox"/> Rototill or cultivate the surface of the sand/soil bed of dry swales if the swale does not draw down within 48 hours.	As needed (infrequent)



# Vegetated Swale

# TC-30

## Additional Information

Research (Colwell et al., 2000) indicates that grass height and mowing frequency have little impact on pollutant removal. Consequently, mowing may only be necessary once or twice a year for safety or aesthetics or to suppress weeds and woody vegetation.

The swale bottom and side slopes should be covered with dense vegetative cover to filter pollutants out of runoff and helps reduce flow velocities and protect the swale from erosion. Fine, close-growing grasses are ideal because increasing the surface area of the vegetation exposed to runoff improves the effectiveness of the swale. Drought tolerant vegetation than can tolerate sediment and debris accumulations are best-suited for swales.

## References

California Department of Transportation. *Treatment BMP Technology Report (CTSW-RT-09-239.06)*, 2010. Available online at:

<http://www.dot.ca.gov/hq/env/stormwater/pdf/CTSW-RT-09-239-06.pdf>.

California Stormwater Quality Association. *Stormwater Best Management Practice Handbook, New Development and Redevelopment*, 2003. Available online at:

<https://www.casqa.org/resources/bmp-handbooks/new-development-redevelopment-bmp-handbook>.

Colwell, Shanti R., Horner, Richard R., and Booth, Derek B., 2000. *Characterization of Performance Predictors and Evaluation of Mowing Practices in Biofiltration Swales*. Report to King County Land and Water Resources Division and others by Center for Urban Water Resources Management, Department of Civil and Environmental Engineering, University of Washington, Seattle.

San Francisco Public Utilities Commission, et al. *San Francisco Stormwater Design Guidelines*. Appendix A, Stormwater BMP Fact Sheets, 2010. Available online at:

<http://www.sfwater.org/modules/showdocument.aspx?documentid=2778>.

Stormwater Managers Resource Center. <http://www.stormwatercenter.net>.

Stormwater Mangers Resource Center, Stormwater Practices for Cold Climates.

<http://www.stormwatercenter.net/Cold%20Climates/cold-climates.htm>.

Tahoe Regional Planning Agency. *Best Management Practices Handbook*, 2012.

Available online at:

<http://www.tahoebmp.org/Documents/2012%20BMP%20Handbook.pdf>.

U.S. Environmental Protection Agency, Post-Construction Stormwater Management in New Development and Redevelopment. BMP Fact Sheets. Available online at:

[http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min\\_measure&min\\_measure\\_id=5](http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min_measure&min_measure_id=5).

# **Vegetated Swale**

**TC-30**

Ventura Countywide Stormwater Quality Management Program. *Technical Guidance Manual for Stormwater Quality Control Measures*, 2010. Available online at: [http://www.vcstormwater.org/documents/workproducts/technicalguidancemanual/2010revisions/Ventura%20Technical%20Guidance%20Document\\_5-6-10.pdf](http://www.vcstormwater.org/documents/workproducts/technicalguidancemanual/2010revisions/Ventura%20Technical%20Guidance%20Document_5-6-10.pdf).

Watershed Management Institute, Inc. *Operation, Maintenance, and Management of Stormwater Management Systems*, 1997. Available online at: <http://www.stormwater.ucf.edu/research/stormwaterOMM/stormwateromm.pdf>.

# Vegetated Buffer Strip

# TC-31

## General Description

Vegetated buffer strips (vegetated filter strips, biostrips, filter strips, and grassed filters) are vegetated surfaces that are designed to treat sheet flow from adjacent surfaces. They are an effective, easy to implement BMP that often go unrecognized at industrial and commercial facilities.

Vegetated buffer strips function by slowing runoff velocities and allowing sediment and other pollutants to settle and by providing some infiltration into underlying soils. They are well-suited to treating runoff from roads, roof downspouts, small parking lots, and pervious surfaces. They can be implemented to provide effective pretreatment for detention and infiltration stormwater BMPs.

Vegetated buffer strips can serve as part of a stormwater drainage system and can replace curbs, gutters and storm sewer systems. Therefore, they are best suited for small landscaped portions of industrial or commercial facilities with low peak flow rates. They are not well suited to treat stormwater runoff from industrial areas that have insufficient source control BMPs.

## Inspection/Maintenance Considerations

Vegetated buffer strips require frequent landscape maintenance. In many cases, vegetated buffer strips initially require intense maintenance, but less maintenance is needed over time. Maintenance tasks may be conducted by a landscaping contractor. Maintenance requirements typically include grass or shrub-growing activities such as irrigation, mowing, trimming, removal of invasive species, and replanting when necessary. Buffer strips require more attention as the volume of sediment increases. Vegetated buffer strips can become a nuisance due to mosquito breeding in level spreaders (unless

## Advanced BMPs Covered



## Maintenance Concerns

- *Vector Control*
- *Invasive Species Management*
- *Vegetation/Landscape Maintenance*
- *Erosion*
- *Channelization of Flow*
- *Aesthetics*

## Targeted Constituents

<i>Sediment</i>	■
<i>Nutrients</i>	●
<i>Trash</i>	▲
<i>Metals</i>	■
<i>Bacteria</i>	●
<i>Oil and Grease</i>	■
<i>Organics</i>	▲

## Legend (Removal Effectiveness)

● Low ■ High ▲ Medium

\* Requires Pretreatment

*Note: The removal effectiveness ratings shown in the table are for properly designed, sited, and maintained BMPs; some configurations will have variations in pollutant effectiveness.*



# Vegetated Buffer Strip

## TC-31

designed to dewater completely in 96 hours or less) and/or if proper drainage slopes are not maintained.

Inspection Activities	Suggested Frequency
<input type="checkbox"/> Once the vegetated buffer strip is established, inspect at least three times per year. Repair all damage immediately. <input type="checkbox"/> Inspect buffer strips after seeding and repair as needed.	Post construction
<input type="checkbox"/> Inspect buffer strip and repair all damage immediately. <input type="checkbox"/> Inspect soil and repair eroded areas.	After major storms
<input type="checkbox"/> Inspect for erosion or damage to vegetation, preferably at the end of the wet season to schedule summer maintenance and before major fall runoff to be sure the strips are ready for winter. However, additional inspection after periods of heavy runoff is desirable. <input type="checkbox"/> Inspect pea-gravel diaphragm/level spreader for clogging and effectiveness and remove built-up sediment. <input type="checkbox"/> Inspect for rolls and gullies. Immediately fill with topsoil, install erosion control blanket and seed or sod. <input type="checkbox"/> Inspect to ensure vegetation is well established. If not, either prepare soil and reseed or replace with alternative species. Install erosion control blanket. <input type="checkbox"/> Check for debris and litter, and areas of sediment accumulation.	Semi-annual
Maintenance Activities	Suggested Frequency
<input type="checkbox"/> Water plants daily for 2 weeks after construction.	Post construction
<input type="checkbox"/> Mow regularly to maintain vegetation height between 2 - 4 inches, and to promote thick, dense vegetative growth. Cut only when soil is dry to prevent tracking damage to vegetation, soil compaction and flow concentrations. Clippings are to be removed immediately after mowing. <input type="checkbox"/> Remove all litter, branches, rocks, or other debris. Damaged areas of the filter strip should be repaired immediately by reseeding and applying mulch. <input type="checkbox"/> Regularly maintain inlet flow spreader. <input type="checkbox"/> Irrigate during dry season (April through October) when necessary to maintain the vegetation.	Frequently, as needed
<input type="checkbox"/> Remulch void areas. <input type="checkbox"/> Treat diseased trees and shrubs, remove dead vegetation.	Semi-annual
<input type="checkbox"/> Remove sediment and replant in areas of buildup. Sediment accumulating near culverts and in channels should be removed when it builds up to 3 in. at any spot, or covers vegetation. <input type="checkbox"/> Limit fertilizer applications based on plant vigor and soil test results. <input type="checkbox"/> Rework or replant buffer strip if concentrated flow erodes a channel through the strip.	Annual

# Vegetated Buffer Strip

# TC-31

## Additional Information

Research (Colwell et al., 2000) indicates that grass height and mowing frequency have little impact on pollutant removal. Consequently, mowing may only be necessary once or twice a year for safety or aesthetics or to suppress weeds and woody vegetation.

Trash tends to accumulate in swale areas, particularly along highways. The need for litter removal is determined through periodic inspection, but litter should always be removed prior to mowing.

The buffer strip should be covered with dense vegetative cover to filter pollutants out of runoff and helps reduce flow velocities and protect the strip from erosion. Fine, close-growing grasses are ideal because increasing the surface area of the vegetation exposed to runoff improves the effectiveness of the swale. Drought tolerant vegetation that can tolerate sediment and debris accumulations is best-suited for vegetated buffer strips.

## References

California Department of Transportation. *Treatment BMP Technology Report (CTSW-RT-09-239.06)*. April, 2010. Available online at:  
<http://www.dot.ca.gov/hq/env/stormwater/pdf/CTSW-RT-09-239-06.pdf>.

California Stormwater Quality Association. *Stormwater Best Management Practice Handbook, New Development and Redevelopment*, 2003. Available online at:  
<https://www.casqa.org/resources/bmp-handbooks/new-development-redevelopment-bmp-handbook>.

California Stormwater Quality Association. *Stormwater Best Management Practice Handbook, New Development and Redevelopment*, 2003. Available online at:  
<https://www.casqa.org/resources/bmp-handbooks/new-development-redevelopment-bmp-handbook>.

Colwell, Shanti R., Horner, Richard R., and Booth, Derek B. *Characterization of Performance Predictors and Evaluation of Mowing Practices in Biofiltration Swales*. Report to King County Land and Water Resources Division and others by Center for Urban Water Resources Management, Department of Civil and Environmental Engineering, University of Washington, Seattle, 2000.

San Francisco Public Utilities Commission, et al. *San Francisco Stormwater Design Guidelines*. Appendix A, Stormwater BMP Fact Sheets, 2010. Available online at:  
<http://www.sfwater.org/modules/showdocument.aspx?documentid=2778>.

Stormwater Managers Resource Center. <http://www.stormwatercenter.net>.

Tahoe Regional Planning Agency. *Best Management Practices Handbook*, 2012. Available online at:  
<http://www.tahoebmp.org/Documents/2012%20BMP%20Handbook.pdf>.



## **Vegetated Buffer Strip**

**TC-31**

U.S. Environmental Protection Agency, Post-Construction Stormwater Management in New Development and Redevelopment. BMP Fact Sheets. Available online at: [http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min\\_measure&min\\_measure\\_id=5](http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min_measure&min_measure_id=5).

Ventura Countywide Stormwater Quality Management Program. *Technical Guidance Manual for Stormwater Quality Control Measures*, 2010. Available online at: [http://www.vcstormwater.org/documents/workproducts/technicalguidancemanual/2010revisions/Ventura%20Technical%20Guidance%20Document\\_5-6-10.pdf](http://www.vcstormwater.org/documents/workproducts/technicalguidancemanual/2010revisions/Ventura%20Technical%20Guidance%20Document_5-6-10.pdf).

Watershed Management Institute, Inc. *Operation, Maintenance, and Management of Stormwater Management Systems*. August, 1997. Available online at: <http://www.stormwater.ucf.edu/research/stormwaterOMM/stormwateromm.pdf>.

## **Appendix G: MIP Inspection Forms**

**MONTHLY BMP INSPECTION REPORT**

Date and Time of Inspection:		Date Report Written:	
<b>Part I. General Information</b>			
<b>Site Information</b>			
Facility Name: <b>KERNEN GLENDALE YARD</b>			
Facility Address: <b>2350 GLENDALE DRIVE, MCKINLEYVILLE, CA</b>			
Photos Taken: (Circle one)	Yes	No	Photo Reference IDs:
<b>Weather</b>			
Estimate storm beginning: (date and time)		Estimate storm duration: (hours)	
Estimate time since last runoff from any drainage area: (days or hours)		Rain gauge reading and location: (in)	
Is a "Qualifying Storm Event" predicted or did one occur (i.e., discharge from site preceded by 48-hrs without discharge)? (Y/N) If yes, summarize forecast:			
<b>Exception Documentation (explanation required if inspection could not be conducted).</b>			
<b>Inspector Information</b>			
Inspector Name:		Inspector Title:	
Signature:		Date:	

<b>Part II. BMP Observations. Describe deficiencies in Part III.</b>			
<b>Minimum BMPs (List and Inspect all BMPs Implemented)</b>	<b>Adequately designed, implemented and effective (yes, no, N/A)</b>	<b>Action Required (yes/no)</b>	<b>Action Implemented (Date)</b>
<b>Good Housekeeping</b>			
<b>Preventative Maintenance</b>			
<b>Spill and Leak Prevention and Response</b>			
<b>Materials Handling and Waste Management</b>			
<b>Erosion and Sediment Controls</b>			

<b>Part II. BMP Observations Continued. Describe deficiencies in Part III.</b>			
<b>Advanced BMPs (List and Inspect all BMPs Implemented)</b>	<b>Adequately designed, implemented and effective (yes, no, N/A)</b>	<b>Action Required (yes/no)</b>	<b>Action Implemented (Date)</b>
<b>Exposure Minimization BMPs</b>			
<b>Stormwater Containment and Discharge Reduction BMPs</b>			
<b>Treatment Control BMPs</b>			
<b>Other Advanced BMPs</b>			



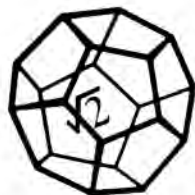
Part III. Descriptions of BMP Deficiencies		
Deficiency	Repairs Implemented: Note - Repairs must be completed as soon as possible.	
	Repaired (Y/N)	Corrective Action Implemented
1.		
2.		
3.		
4.		

Part IV. Additional Corrective Actions Required. Identify additional corrective actions not included with BMP Deficiencies (Part III) above. Identify BMPs that need more frequent inspection. Note if SWPPP change is required.	
Required Actions	Implementation Date

<b>Visual Observation Log - Monthly</b>	
Date and Time of Inspection:	Report Date:
Facility Name: Kernen Glendale	
<b>Weather</b>	
Antecedent Conditions (last 48 hours):	Current Weather:
<b>NSWD Observations</b>	
Were any authorized non-stormwater discharges observed?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Were any <b>unauthorized</b> non-stormwater discharges observed?	Yes <input type="checkbox"/> No <input type="checkbox"/>
If yes to either, identify source:	
<b>Outdoor Industrial Equipment and Storage Area Observations</b>	
Complete Monthly BMP Inspection Report	Yes <input type="checkbox"/> No <input type="checkbox"/>
Southern Yard:	Were any deficiencies or any other potential source of industrial pollutants observed? Yes <input type="checkbox"/> No <input type="checkbox"/>
Northern Yard:	Were any deficiencies or any other potential source of industrial pollutants observed? Yes <input type="checkbox"/> No <input type="checkbox"/>
If yes to any, describe:	
Exception Documentation (explanation required if inspection could not be conducted).	
<b>Inspector Information</b>	
Inspector Name:	Inspector Title:
Signature:	Date:

<b>Visual Observation Log – Sampling Events</b>			
Date and Time of Inspection:			Report Date:
Facility Name: Kernen Glendale			
<b>Weather</b>			
Antecedent Conditions (last 48 hours):			Weather:
Precipitation Total:			Predicted % chance of rain:
Estimate storm beginning: _____ (date and time)	Estimate storm duration: _____ (hours)	Estimate time since last storm: _____ (days or hours)	Rain gauge reading: _____ (inches)
<b>Sampling Event Observations</b>			
Observations: If yes identify location and observe drainage area to identify probable cause			
Odors	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Floating material	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Suspended Material	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Sheen	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Discolorations	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Turbidity	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
<b>NSWD Observations</b>			
Were any authorized non-stormwater discharges observed?		Yes <input type="checkbox"/>	No <input type="checkbox"/>
Were any <b>unauthorized</b> non-stormwater discharges observed?		Yes <input type="checkbox"/>	No <input type="checkbox"/>
If yes to either, identify source			
<b>Drainage Area Observations</b>			
<b>Drainage Area</b>		<b>Deficiencies Noted</b>	
Exception Documentation (explanation required if inspection could not be conducted).			
<b>Inspector Information</b>			
Inspector Name:		Inspector Title:	
Signature:		Date:	

SAMPLING LOG		
Facility Name: Kernen Glendale	Date:	Time Start:
Sampler Name:		
Field Meter Calibration		
pH Meter ID No./Description:		
Calibration Date/Time:		
Field pH Measurements		
Discharge Location Identifier	pH	Time
Samples Collected		
Discharge Location Identifier	Constituent	Time
	Oil and Grease,	
	Total Suspended Solids, Nitrate + Nitrite	
	Aluminum, Copper, Iron, Lead, Zinc	
Additional Sampling Notes:		
Time End:		



5680 West End Road • Arcata • CA 95521-9202  
707-822-4649 Fax 707-822-6831

## LABORATORY NUMBER:

Sampler (Sign & Print): \_\_\_\_\_

## Purchase Order Number: \_\_\_\_\_

[illegible][illegible]

**CHAIN OF CUSTODY SEALS Y/N/NA**  
**SHIPPED VIA:** UPS Fed-Ex Hand

**ALL CONTAMINATED NON-AQUEOUS SAMPLES WILL BE RETURNED TO CLIENT**



## **Appendix H: Industrial General Permit**

A copy of the industrial permit can be found in the office at Kernen Construction located at 2350 Glendale Drive, McKinleyville, CA.

Eureka, CA | Arcata, CA | Redding, CA | Willits, CA | Fort Bragg, CA | Coos Bay, OR | Klamath Falls, OR



**EXHIBIT “B” FOLLOWS THIS PAGE**



State of California  
STATE WATER RESOURCES CONTROL BOARD



GAVIN NEWSOM  
GOVERNOR



JARED BLUMENFELD  
SECRETARY FOR  
ENVIRONMENTAL PROTECTION

2021-2022  
**ANNUAL REPORT**  
FOR STORM WATER DISCHARGES  
ASSOCIATED WITH INDUSTRIAL ACTIVITIES

Reporting Period July 1, 2021 through June 30, 2022

**Retain a copy of the completed Annual Report for your records.**

Please remember that a Notice of Termination and new Notice of Intent are required whenever a facility operation is relocated or changes ownership.

If you have any questions, please contact your Regional Board Industrial Storm Water Permit Contact. The names, telephone numbers, and e-mail addresses of the Regional Board contacts, as well as the Regional Board office addresses, can be found at:

[http://www.waterboards.ca.gov/water\\_issues/programs/stormwater/contact.shtml](http://www.waterboards.ca.gov/water_issues/programs/stormwater/contact.shtml)

**General Information**

**A. Facility Information**

WDID: 1 121017319

Business Name: Kernen Construction Glendale Yard

Physical Address: 2350 Glendale Dr

City: Mc Kinleville

Contact Person: Scott Farley

State: CA

Phone: 707-826-8686

Zip: 95519

Email: [vstiohn@kernenconstruction.com](mailto:vstiohn@kernenconstruction.com)

Standard Industrial Classification (SIC) Codes: 1429-Crushed and Broken Stone. NEC.4212-Lo

**B. Facility Owner Information**

Business Name: Kernen Construction Co

Mailing Address: PO Box 1340

City: Blue Lake

Contact Person: Scott Farley

State: CA

Phone: 707-826-8686

Zip: 95525

Email: [vstiohn@kernenconstruction.com](mailto:vstiohn@kernenconstruction.com)

**C. Facility Billing Information**

Business Name: Kernen Construction

Mailing Address: PO Box 1340

City: Blue Lake

Contact Person: Scott Farley

State: CA

Phone: 707-826-8686

Zip: 95525

Email: [vstiohn@kernenconstruction.com](mailto:vstiohn@kernenconstruction.com)



2021-2022  
Annual Report for WDID 1 12I017319



## Question Information

1. Has the Discharger conducted monthly visual observations (including authorized and unauthorized Non-Storm Water Discharges and Best Management Practices) in accordance with Section XI.A.1?

☒ Yes ☐ No

If No, see Attachment 1, Summary of Explanation.

2. Has the Discharger conducted sampling event visual observations at each discharge location where a sample was obtained in accordance with Section XI.A.2?

☐ Yes ☒ No

If No, see Attachment 1, Summary of Explanation.

3. Did you sample the required number of Qualifying Storm Events during the reporting year for all discharge locations, in accordance with Section XI.B?

☐ Yes ☒ No

If No, see Attachment 1, Summary of Explanation.

4. How many storm water discharge locations are at your facility?

0

5. Has the Discharger chosen to select Alternative Discharge Locations in accordance with Section XI.C.3?

☐ Yes ☒ No

6. Has the Discharger reduced the number of sampling locations within a drainage area in accordance with the Representative Sampling Reduction in Section XI.C.4?

☐ Yes ☒ No

6.1. Has the Discharger reduced the frequency of sampling at the facility area in accordance with the Sample Frequency Reduction in Section XI.C.7?

☐ Yes ☒ No





2021-2022  
Annual Report for WDID 1 12I017319



GAVIN NEWSOM  
GOVERNOR



JARED BLUMENFELD  
SECRETARY FOR  
ENVIRONMENTAL PROTECTION

7. Permitted facilities located within an impaired watershed must assess for potential pollutants that may be present in the facility's industrial storm water discharge. Using the table below, populated based on the facility's location, indicate the presence of the potential pollutant at the facility.

See Attachment 2 for the List of Identified Pollutants within the Impaired Watershed.

8. Has the Discharger included the above pollutants in the SWPPP pollutant source assessment and assessed the need for analytical monitoring for the pollutants?

☒ Yes ☐ No

If No, what date will the parameter(s) will be added to the SWPPP and Monitoring Implementation Plan?

9. Were all samples collected in accordance with Section XI.B.5?

☐ Yes ☒ No

If No, see Attachment 1, Summary of Explanation.

10. Has any contained storm water been discharged from the facility this reporting year?

☐ Yes ☒ No

If Yes, see Attachment 1, Summary of Explanation.

11. Has the Discharger conducted one (1) annual evaluation during the reporting year as required in Section XV?

☒ Yes ☐ No

If Yes, what date was the annual evaluation conducted? 07/08/2022

If No, see Attachment 1, Summary of Explanation.



2021-2022  
Annual Report for WDID 1 12I017319



GAVIN NEWSOM  
GOVERNOR



JARED BLUMENFELD  
SECRETARY FOR  
ENVIRONMENTAL PROTECTION

12. Has the Discharger maintained records on-site for the reporting year in accordance with XXI.J.3?

☒ Yes ☐ No

If No, see Attachment 1, Summary of Explanation.

13. Did additional NAL exceedances occur in the same drainage area for the facility's Level 2 parameter(s) (if no Level 2 parameters, select No)?

☐ Yes ☒ No

14. Was the Level 2 ERA Technical Report updated (if no Level 2 parameters, select No)?

☐ Yes ☒ No

If No, explain:

no, but SWPPP updated in February 2022

If your facility is subject to Effluent Limitation Guidelines in Attachment F of the Industrial General Permit, include your specific requirements as an attachment to the Annual Report (attach as file type: Supporting Documentation).

## ANNUAL REPORT CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under the direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Printed Name: Norman Farley

Title: Partner

Date: 07/12/2022

2021-2022

**Annual Report for WDID 1 12I017319****Summary of Explanations**

<b>Explanation Question</b>	<b>Explanation Text</b>
Question 2	Discharge reduction BMPs installed over the past two seasons have effectively reduced/prevented stormwater discharges from the site. No discharge samples collected.
Question 3	Discharge reduction BMPs installed over the past two seasons have effectively reduced/prevented stormwater discharges from the site
Question 9	Discharge reduction BMPs installed over the past two seasons have effectively reduced/prevented stormwater discharges from the site

**Summary of Attachments**

<b>Attachment Type</b>	<b>Attachment Title</b>	<b>Description</b>	<b>Date Uploaded</b>	<b>Part Number</b>	<b>Attachment Hash</b>
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2021-2022

**Annual Report for WDID 1 12I017319****List of Identified Pollutants within the Impaired Watershed**

<b>Parameter</b>	<b>Pollutant</b>	<b>Present at Facility?</b>
Temperature	Temperature, water	No
Turbidity	Turbidity	No

**EXHIBIT “C” FOLLOWS THIS PAGE**





State of California  
STATE WATER RESOURCES CONTROL BOARD



2022-2023  
**ANNUAL REPORT**  
FOR STORM WATER DISCHARGES  
ASSOCIATED WITH INDUSTRIAL ACTIVITIES

Reporting Period July 1, 2022 through June 30, 2023

**Retain a copy of the completed Annual Report for your records.**

Please remember that a Notice of Termination and new Notice of Intent are required whenever a facility operation is relocated or changes ownership.

If you have any questions, please contact your Regional Board Industrial Storm Water Permit Contact. The names, telephone numbers, and e-mail addresses of the Regional Board contacts, as well as the Regional Board office addresses, can be found at:

[http://www.waterboards.ca.gov/water\\_issues/programs/stormwater/contact.shtml](http://www.waterboards.ca.gov/water_issues/programs/stormwater/contact.shtml)

**General Information**

**A. Facility Information**

WDID: 1 12I017319

Business Name: Kernen Construction Glendale Yard

Physical Address: 2350 Glendale Dr

City: Mc Kinlevville

Contact Person: Scott Farley

State: CA

Phone: 707-826-8686

Zip: 95519

Email: [vstiohn@kernenconstruction.com](mailto:vstiohn@kernenconstruction.com)

Standard Industrial Classification (SIC) Codes: 1429-Crushed and Broken Stone. NEC.4212-Lo

**B. Facility Owner Information**

Business Name: Kernen Construction Co

Mailing Address: PO Box 1340

City: Blue Lake

Contact Person: Scott Farley

State: CA

Phone: 707-826-8686

Zip: 95525

Email: [vstiohn@kernenconstruction.com](mailto:vstiohn@kernenconstruction.com)

**C. Facility Billing Information**

Business Name: Kernen Construction

Mailing Address: PO Box 1340

City: Blue Lake

Contact Person: Scott Farley

State: CA

Phone: 707-826-8686

Zip: 95525

Email: [vstiohn@kernenconstruction.com](mailto:vstiohn@kernenconstruction.com)



2022-2023  
Annual Report for WDID 1 12I017319



## Question Information

1. Has the Discharger conducted monthly visual observations (including authorized and unauthorized Non-Storm Water Discharges and Best Management Practices) in accordance with Section XI.A.1?

☒ Yes ☐ No

If No, see Attachment 1, Summary of Explanation.

2. Has the Discharger conducted sampling event visual observations at each discharge location where a sample was obtained in accordance with Section XI.A.2?

☐ Yes ☒ No

If No, see Attachment 1, Summary of Explanation.

3. Did you sample the required number of Qualifying Storm Events during the reporting year for all discharge locations, in accordance with Section XI.B?

☐ Yes ☒ No

If No, see Attachment 1, Summary of Explanation.

4. How many storm water discharge locations are at your facility?

0

5. Has the Discharger chosen to select Alternative Discharge Locations in accordance with Section XI.C.3?

☐ Yes ☒ No

6. Has the Discharger reduced the number of sampling locations within a drainage area in accordance with the Representative Sampling Reduction in Section XI.C.4?

☐ Yes ☒ No

6.1. Has the Discharger reduced the frequency of sampling at the facility area in accordance with the Sample Frequency Reduction in Section XI.C.7?

☐ Yes ☒ No



2022-2023  
Annual Report for WDID 1 12I017319



7. Permitted facilities located within an impaired watershed must assess for potential pollutants that may be present in the facility's industrial storm water discharge. Using the table below, populated based on the facility's location, indicate the presence of the potential pollutant at the facility.

See Attachment 2 for the List of Identified Pollutants within the Impaired Watershed.

8. Has the Discharger included the above pollutants in the SWPPP pollutant source assessment and assessed the need for analytical monitoring for the pollutants?

☒ Yes ☐ No

If No, what date will the parameter(s) will be added to the SWPPP and Monitoring Implementation Plan?

9. Were all samples collected in accordance with Section XI.B.5?

☐ Yes ☒ No

If No, see Attachment 1, Summary of Explanation.

10. Has any contained storm water been discharged from the facility this reporting year?

☐ Yes ☒ No

If Yes, see Attachment 1, Summary of Explanation.

11. Has the Discharger conducted one (1) annual evaluation during the reporting year as required in Section XV?

☒ Yes ☐ No

If Yes, what date was the annual evaluation conducted? 07/07/2023

If No, see Attachment 1, Summary of Explanation.



2022-2023  
Annual Report for WDID 1 12I017319



12. Has the Discharger maintained records on-site for the reporting year in accordance with XXI.J.3?

☒ Yes ☐ No

If No, see Attachment 1, Summary of Explanation.

13. Did additional NAL exceedances occur in the same drainage area for the facility's Level 2 parameter(s) (if no Level 2 parameters, select No)?

☐ Yes ☒ No

14. Was the Level 2 ERA Technical Report updated (if no Level 2 parameters, select No)?

☐ Yes ☒ No

If No, explain:

Discharge reduction BMPs installed effectively

If your facility is subject to Effluent Limitation Guidelines in Attachment F of the Industrial General Permit, include your specific requirements as an attachment to the Annual Report (attach as file type: Supporting Documentation).

## ANNUAL REPORT CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under the direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Printed Name: Norman Farley

Title: Partner

Date: 07/07/2023

2022-2023

**Annual Report for WDID 1 12I017319****Summary of Explanations**

<b>Explanation Question</b>	<b>Explanation Text</b>
Question 2	Discharge reduction BMPs installed effectively prevented stormwater discharge from the site. No discharge samples collected.
Question 3	Discharge reduction BMPs installed effectively prevented stormwater discharge from the site. No discharge samples collected.
Question 9	Discharge reduction BMPs installed effectively prevented stormwater discharge from the site. No discharge samples collected.

**Summary of Attachments**

<b>Attachment Type</b>	<b>Attachment Title</b>	<b>Description</b>	<b>Date Uploaded</b>	<b>Part Number</b>	<b>Attachment Hash</b>
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2022-2023

**Annual Report for WDID 1 12I017319**

**List of Identified Pollutants within the Impaired Watershed**

<b>Parameter</b>	<b>Pollutant</b>	<b>Present at Facility?</b>
Temperature	Temperature, water	No
Turbidity	Turbidity	No

**EXHIBIT “D” FOLLOWS THIS PAGE**



State of California  
STATE WATER RESOURCES CONTROL BOARD



2023-2024  
**ANNUAL REPORT**  
FOR STORM WATER DISCHARGES  
ASSOCIATED WITH INDUSTRIAL ACTIVITIES

Reporting Period July 1, 2023 through June 30, 2024

**Retain a copy of the completed Annual Report for your records.**

Please remember that a Notice of Termination and new Notice of Intent are required whenever a facility operation is relocated or changes ownership.

If you have any questions, please contact your Regional Board Industrial Storm Water Permit Contact. The names, telephone numbers, and e-mail addresses of the Regional Board contacts, as well as the Regional Board office addresses, can be found at:

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Email: [vstiohn@kernenconstruction.com](mailto:vstiohn@kernenconstruction.com)

Standard Industrial Classification (SIC) Codes: 1429-Crushed and Broken Stone. NEC.4212-Lo

**B. Facility Owner Information**

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Mailing Address: PO Box 1340

City: Blue Lake

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State: CA

Phone: 707-826-8686

Zip: 95525

Email: [vstiohn@kernenconstruction.com](mailto:vstiohn@kernenconstruction.com)

**C. Facility Billing Information**

Business Name: Kernen Construction

Mailing Address: PO Box 1340

City: Blue Lake

Contact Person: Scott Farley

State: CA

Phone: 707-826-8686

Zip: 95525

Email: [vstiohn@kernenconstruction.com](mailto:vstiohn@kernenconstruction.com)



2023-2024  
Annual Report for WDID 1 12I017319



## Question Information

1. Has the Discharger conducted monthly visual observations (including authorized and unauthorized Non-Storm Water Discharges and Best Management Practices) in accordance with Section XI.A.1?

☒ Yes ☐ No

If No, see Attachment 1, Summary of Explanation.

2. Has the Discharger conducted sampling event visual observations at each discharge location where a sample was obtained in accordance with Section XI.A.2?

☐ Yes ☒ No

If No, see Attachment 1, Summary of Explanation.

3. Did you sample the required number of Qualifying Storm Events during the reporting year for all discharge locations, in accordance with Section XI.B?

☐ Yes ☒ No

If No, see Attachment 1, Summary of Explanation.

4. How many storm water discharge locations are at your facility?

0

5. Has the Discharger chosen to select Alternative Discharge Locations in accordance with Section XI.C.3?

☐ Yes ☒ No

6. Has the Discharger reduced the number of sampling locations within a drainage area in accordance with the Representative Sampling Reduction in Section XI.C.4?

☐ Yes ☒ No

6.1. Has the Discharger reduced the frequency of sampling at the facility area in accordance with the Sample Frequency Reduction in Section XI.C.7?

☐ Yes ☒ No



2023-2024  
Annual Report for WDID 1 12I017319



GAVIN NEWSOM  
GOVERNOR



YANA GARCIA  
SECRETARY FOR  
ENVIRONMENTAL PROTECTION

7. Permitted facilities located within an impaired watershed must assess for potential pollutants that may be present in the facility's industrial storm water discharge. Using the table below, populated based on the facility's location, indicate the presence of the potential pollutant at the facility.

See Attachment 2 for the List of Identified Pollutants within the Impaired Watershed.

8. Has the Discharger included the above pollutants in the SWPPP pollutant source assessment and assessed the need for analytical monitoring for the pollutants?

☒ Yes ☐ No

If No, what date will the parameter(s) will be added to the SWPPP and Monitoring Implementation Plan?

9. Were all samples collected in accordance with Section XI.B.5?

☐ Yes ☒ No

If No, see Attachment 1, Summary of Explanation.

10. Has any contained storm water been discharged from the facility this reporting year?

☐ Yes ☒ No

If Yes, see Attachment 1, Summary of Explanation.

11. Has the Discharger conducted one (1) annual evaluation during the reporting year as required in Section XV?

☒ Yes ☐ No

If Yes, what date was the annual evaluation conducted? 06/14/2024

If No, see Attachment 1, Summary of Explanation.





2023-2024  
Annual Report for WDID 1 12I017319



12. Has the Discharger maintained records on-site for the reporting year in accordance with XXI.J.3?

☒ Yes ☐ No

If No, see Attachment 1, Summary of Explanation.

13. Did additional NAL exceedances occur in the same drainage area for the facility's Level 2 parameter(s) (if no Level 2 parameters, select No)?

☐ Yes ☒ No

14. Was the Level 2 ERA Technical Report updated (if no Level 2 parameters, select No)?

☐ Yes ☒ No

If No, explain:

Reduction BMP's installed effecively

If your facility is subject to Effluent Limitation Guidelines in Attachment F of the Industrial General Permit, include your specific requirements as an attachment to the Annual Report (attach as file type: Supporting Documentation).

## ANNUAL REPORT CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under the direction or supervision in accordance with a system designed to assure that qualified personnel properly gether and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Printed Name: Norman Farley

Title: Partner

Date: 07/10/2024

2023-2024

**Annual Report for WDID 1 12I017319****Summary of Explanations**

<b>Explanation Question</b>	<b>Explanation Text</b>
Question 2	Reduction BMPs installed effectively prevented stormwater discharge from the site. No discharge samples collected.
Question 3	Reduction BMPs installed effectively prevented stormwater discharge from the site. No discharge samples collected.
Question 9	Reduction BMPs installed effectively prevented stormwater discharge from the site. No discharge samples collected.

**Summary of Attachments**

<b>Attachment Type</b>	<b>Attachment Title</b>	<b>Description</b>	<b>Date Uploaded</b>	<b>Part Number</b>	<b>Attachment Hash</b>
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2023-2024

**Annual Report for WDID 1 12I017319**

**List of Identified Pollutants within the Impaired Watershed**

Parameter	Pollutant	Present at Facility?
Temperature	Temperature, water	No
Turbidity	Turbidity	No

**EXHIBIT “E” FOLLOWS THIS PAGE**

## NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

ORDER WQ 2014-0057-DWQ,  
AS AMENDED BY ORDER WQ 2015-0122-DWQ &  
ORDER WQ 2018-0028-DWQ

GENERAL PERMIT FOR  
STORM WATER DISCHARGES  
ASSOCIATED WITH INDUSTRIAL ACTIVITIES

ORDER  
NPDES NO. CAS000001

Order WQ 2014-0057-DWQ was adopted by the State Water Resources Control Board on:	<b>April 1, 2014</b>
Order WQ 2014-0057-DWQ became effective on:	<b>July 1, 2015</b>
Order WQ 2015-0122-DWQ was adopted and became effective on:	<b>August 4, 2015</b>
Order WQ 2018-0028-DWQ was adopted on:	<b>November 6, 2018</b>
Order WQ 2018-0028-DWQ shall become effective on:	<b>July 1, 2020</b>
This Order's expiration date is:	<b>June 30, 2020</b>
In accordance with Order Section XXI.S, if this Order is not reissued or replaced prior to the expiration date, it will be administratively continued in accordance with 40 Code of Federal Regulations 122.6 and remain in full force and effect.	

**CERTIFICATION**

I, Courtney Tyler, Clerk to the Board, do hereby certify that this Order, including its fact sheet, attachments, and appendices is a full, true, and correct copy of an Order adopted by the State Water Resources Control Board, on April 1, 2014, and amended by the State Water Resources Control Board on August 4, 2015, and November 6, 2018.

AYE: Vice Chair Steven Moore  
Board Member Dorene D'Adamo  
Board Member E. Joaquin Esquivel  
NAY: None  
ABSENT: Chair Felicia Marcus  
Board Member Tam M. Doduc  
ABSTAIN: None

  
Courtney Tyler  
Clerk to the Board

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**ATTACHMENTS AND APPENDICES**

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Attachment B	Acronyms
Attachment C	Glossary
Attachment D	Permit Registration Documents (PRDs)
Attachment E	TMDL Implementation
Attachment F	Effluent Limitation Guidelines (ELGs)
Attachment G	Requirements for Dischargers Who Have Been Granted An Ocean Plan Exception for Discharges to Areas of Special Biological Significance (ASBS)
Attachment H	Storm Water Sample Collection and Handling Instructions
Attachment I	Compliance Options



**Industrial General Permit Order**

- Appendix 1 Storm Water Pollution Prevention Plan (SWPPP) Checklist
- Appendix 2 No Exposure Certification (NEC) Conditional Exclusion Instructions
- Appendix 3 Waterbodies with Clean Water Act section 303(d) Listed Impairments

**Industrial General Permit Order****I. FINDINGS****A. General Findings**

The State Water Resources Control Board (State Water Board) finds that:

1. The Federal Clean Water Act (Clean Water Act) prohibits certain discharges of storm water containing pollutants except in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. (33 U.S.C. §§ 1311, 1342 (also referred to as Clean Water Act §§ 301, 402).) The United States Environmental Protection Agency (U.S. EPA) promulgates federal regulations to implement the Clean Water Act's mandate to control pollutants in storm water discharges. (40 C.F.R. § 122, et seq.) The NPDES permit must require implementation of Best Available Technology Economically Achievable (BAT) and Best Conventional Pollutant Control Technology (BCT) to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges (NSWDs). The NPDES permit must also include additional requirements necessary to implement applicable water quality objectives or water quality standards (water quality standards, collectively).
2. On November 16, 1990, U.S. EPA promulgated Phase I storm water regulations in compliance with section 402(p) of the Clean Water Act. (55 Fed. Reg. 47990, codified at 40 C.F.R. § 122.26.) These regulations require operators of facilities subject to storm water permitting (Dischargers), that discharge storm water associated with industrial activity (industrial storm water discharges), to obtain an NPDES permit. Section 402(p)(3)(A) of the Clean Water Act also requires that permits for discharges associated with industrial activity include requirements necessary to meet water quality standards.
3. Phase II storm water regulations<sup>1</sup> require permitting for storm water discharges from facilities owned and operated by a municipality with a population of less than 100,000. The previous exemption from the Phase I permitting requirements under section 1068 of the Intermodal Surface Transportation Efficiency Act of 1991 was eliminated.
4. This Order (General Permit) is an NPDES General Permit issued in compliance with section 402 of the Clean Water Act and shall take effect on July 1, 2015, provided that the Regional Administrator of U.S. EPA has no objection. If the U.S. EPA Regional Administrator has an objection, this General Permit will not become effective until the objection is withdrawn.
5. This action to adopt an NPDES General Permit is exempt from the provisions of the California Environmental Quality Act (Pub. Resources Code, § 21000, et seq.) in accordance with section 13389 of the Water Code. (See County of

---

<sup>1</sup> U.S. EPA. [Final NPDES Phase II Rule](http://cfpub.epa.gov/npdes/stormwater/swfinal.cfm). <<http://cfpub.epa.gov/npdes/stormwater/swfinal.cfm>>. [as of February 4, 2014]

**Industrial General Permit Order**

Los Angeles v. California State Water Resources Control Bd. (2006) 143 Cal.App.4th 985.)

6. State Water Board Order 97-03-DWQ is rescinded as of the effective date of this General Permit (July 1, 2015) except for Order 97-03-DWQ's requirement that annual reports be submitted by August 14, 2015 and except for enforcement purposes.
7. Effective July 1, 2015, the State Water Board and the Regional Water Quality Control Boards (Regional Water Boards) (Water Boards, collectively) will enforce the provisions herein.
8. This General Permit authorizes discharges of industrial storm water to waters of the United States, so long as those discharges comply with all requirements, provisions, limitations, and prohibitions in this General Permit.
9. Industrial activities covered under this General Permit are described in Attachment A.
10. The Fact Sheet for this Order is incorporated as findings of this General Permit.
11. Acronyms are defined in Attachment B and terms used in this General Permit are defined in Attachment C.
12. This General Permit regulates industrial storm water discharges and authorized NSWDS from specific categories of industrial facilities identified in Attachment A hereto, and industrial storm water discharges and authorized NSWDS from facilities designated by the Regional Water Boards to obtain coverage under this General Permit. This General Permit does not apply to industrial storm water discharges and NSWDS that are regulated by other individual or general NPDES permits
13. This General Permit does not preempt or supersede the authority of municipal agencies to prohibit, restrict, or control industrial storm water discharges and authorized NSWDS that may discharge to storm water conveyance systems or other watercourses within their jurisdictions as allowed by state and federal law.
14. All terms defined in the Clean Water Act, U.S. EPA regulations, and the Porter-Cologne Water Quality Control Act (Wat. Code, § 13000, et seq.) will have the same definition in this General Permit unless otherwise stated.
15. Pursuant to 40 Code of Federal Regulations section 131.12 and State Water Board Resolution 68-16, which incorporates the requirements of 40 Code of Federal Regulations section 131.12 where applicable, the State Water Board finds that discharges in compliance with this General Permit will not result in the lowering of water quality to a level that does not achieve water quality objectives and protect beneficial uses. Any degradation of water quality from existing high quality water to a level that achieves water quality objectives and

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protects beneficial uses is appropriate to support economic development. This General Permit's requirements constitute best practicable treatment or control for discharges of industrial storm water and authorized non-storm water discharges, and are therefore consistent with those provisions.

16. Compliance with any specific limits or requirements contained in this General Permit does not constitute compliance with any other applicable permits.
17. This General Permit requires that the Discharger certify and submit all Permit Registration Documents (PRDs) for Notice of Intent (NOI) and No Exposure Certification (NEC) coverage via the State Water Board's Storm Water Multiple Application and Report Tracking System (SMARTS) website. (See Attachment D for an example of the information required to be submitted in the PRDs via SMARTS.) All other documents required by this General Permit to be electronically certified and submitted via SMARTS can be submitted by the Discharger or by a designated Duly Authorized Representative on behalf of the Discharger. Electronic reporting is required to reduce the state's reliance on paper, to improve efficiency, and to make such General Permit documents more easily accessible to the public and the Water Boards.
18. All information provided to the Water Boards shall comply with the Homeland Security Act and all other federal law that concerns security in the United States, as applicable.

### **B. Industrial Activities Not Covered Under this General Permit**

19. Discharges of storm water from areas on tribal lands are not covered under this General Permit. Storm water discharges from industrial facilities on tribal lands are regulated by a separate NPDES permit issued by U.S. EPA.
20. Discharges of storm water regulated under another individual or general NPDES permit adopted by the State Water Board or Regional Water Board are not covered under this General Permit, including the State Water Board NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities.
21. Storm water discharges to combined sewer systems are not covered under this General Permit. These discharges must be covered by an individual permit. (40 C.F.R. § 122.26(a)(7).)
22. Conveyances that discharge storm water runoff combined with municipal sewage are not covered under this General Permit.
23. Discharges of storm water identified in Clean Water Act section 402(l) (33 U.S.C. § 1342(l)) are not covered under this General Permit.
24. Facilities otherwise subject to this General Permit but for which a valid Notice of Non-Applicability (NONA) has been certified and submitted via SMARTS, by the Entity are not covered under this General Permit. Entities

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(See Section XX.C.1 of this General Permit) who are claiming “No Discharge” through the NONA shall meet the eligibility requirements and provide a No Discharge Technical Report in accordance with Section XX.C.

25. This General Permit does not authorize discharges of dredged or fill material regulated by the US Army Corps of Engineers under section 404 of the Clean Water Act and does not constitute a water quality certification under section 401 of the Clean Water Act.

### C. Discharge Prohibitions

26. Pursuant to section 13243 of the Water Code, the State Water Board may specify certain conditions or areas where the discharge of waste, or certain types of waste, is prohibited.
27. With the exception of certain authorized NSWDs as defined in Section IV, this General Permit prohibits NSWDs. The State Water Board recognizes that certain NSWDs should be authorized because they are not generated by industrial activity, are not significant sources of pollutants when managed appropriately, and are generally unavoidable because they are related to safety or would occur regardless of industrial activity. Prohibited NSWDs may be authorized under other individual or general NPDES permits, or waste discharge requirements issued by the Water Boards.
28. Prohibited NSWDs are referred to as unauthorized NSWDs in this General Permit. Unauthorized NSWDs shall be either eliminated or permitted by a separate NPDES permit. Unauthorized NSWDs may contribute significant pollutant loads to receiving waters. Measures to control sources of unauthorized NSWDs such as spills, leakage, and dumping, must be addressed through the implementation of Best Management Practices (BMPs).
29. This General Permit incorporates discharge prohibitions contained in water quality control plans, as implemented by the Water Boards.
30. Direct discharges of waste, including industrial storm water discharges, to Areas of Special Biological Significance (ASBS) are prohibited unless the Discharger has applied for and the State Water Board has granted an exception to the State Water Board’s 2009 Water Quality Control Plan for Ocean Waters of California as amended by State Water Board Resolution 2012-0056 (California Ocean Plan)<sup>2</sup> allowing the discharge.

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<sup>2</sup> State Water Resources Control Board. [Ocean Standards Web Page](http://www.waterboards.ca.gov/water_issues/programs/ocean/).  
<[http://www.waterboards.ca.gov/water\\_issues/programs/ocean/](http://www.waterboards.ca.gov/water_issues/programs/ocean/)>.  
[as of February 4, 2014].

State Water Resources Control Board. [Water Quality Control Plan for Ocean Waters of California 2009](#).

**Industrial General Permit Order****D. Effluent Limitations**

31. Section 301(b) of the Clean Water Act and 40 Code of Federal Regulations section require NPDES permits to include technology-based requirements at a minimum, and any more stringent effluent limitations necessary for receiving waters to meet applicable water quality standards. Clean Water Act section 402(p)(3)(A) requires that discharges of storm water runoff from industrial facilities comply with Clean Water Act section 301.
32. This General Permit requires control of pollutant discharges using BAT and BCT to reduce and prevent discharges of pollutants, and any more stringent effluent limitations necessary for receiving waters to meet applicable water quality standards.
33. It is not feasible for the State Water Board to establish numeric technology based effluent limitations for discharges authorized by this General Permit at this time. The rationale for this determination is discussed in detail in the Fact Sheet of this General Permit. Therefore, this General Permit requires Dischargers to implement minimum BMPs and applicable advanced BMPs as defined in Section X.H (collectively, BMPs) to comply with the requirements of this General Permit. This approach is consistent with U.S. EPA's 2008 Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activity (2008 MSGP).
34. 40 Code of Federal Regulations section 122.44(d) requires that NPDES permits include Water Quality Based Effluent Limitations (WQBELs) to attain and maintain applicable numeric and narrative water quality standards for receiving waters.
35. Where numeric water quality criteria have not been established, 40 Code of Federal Regulations section 122.44(d)(1)(vi) provides that WQBELs may be established using U.S. EPA criteria guidance under section 304(a) of the Clean Water Act, a proposed state criteria or policy interpreting narrative criteria supplemented with other relevant information, and/or an indicator parameter.
36. This General Permit requires Dischargers to implement BMPs when necessary, in order to support attainment of water quality standards. The use of BMPs to control or abate the discharge of pollutants is authorized by 40 Code of Federal Regulations section 122.44(k)(3) because numeric effluent limitations are infeasible and implementation of BMPs is reasonably necessary to achieve effluent limitations and water quality standards, and to

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<[http://www.waterboards.ca.gov/water\\_issues/programs/ocean/docs/2009\\_cop\\_adop\\_tedeffective\\_usepa.pdf](http://www.waterboards.ca.gov/water_issues/programs/ocean/docs/2009_cop_adop_tedeffective_usepa.pdf)>. [as of February 4, 2014].

State Water Resources Control Board. [Resolution 2012-0056](#).

<[http://www.swrcb.ca.gov/board\\_decisions/adopted\\_orders/resolutions/2012/rs2012\\_0056.pdf](http://www.swrcb.ca.gov/board_decisions/adopted_orders/resolutions/2012/rs2012_0056.pdf)>. [as of February 4, 2014].



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carry out the purposes and intent of the Clean Water Act. (40 C.F.R. § 122.44(k)(4).)

**E. Receiving Water Limitations**

37. This General Permit requires compliance with receiving water limitations based on water quality standards. The primary receiving water limitation requires that industrial storm water discharges and authorized NSWDS not cause or contribute to an exceedance of applicable water quality standards. Water quality standards apply to the quality of the receiving water, not the quality of the industrial storm water discharge. Therefore, compliance with the receiving water limitations generally cannot be determined solely by the effluent water quality characteristics. If any Discharger's storm water discharge causes or contributes to an exceedance of a water quality standard, that Discharger must implement additional BMPs or other control measures in order to attain compliance with the receiving water limitation. Compliance with water quality standards may, in some cases, require Dischargers to implement controls that are more protective than controls implemented solely to comply with the technology-based requirements in this General Permit.

**F. Total Maximum Daily Loads (TMDLs)**

38. TMDLs relate to the maximum amount of a pollutant that a water body can receive and still attain water quality standards. A TMDL is defined as the sum of the allowable loads of a single pollutant from all contributing point sources (the waste load allocations) and non-point sources (load allocations), the contribution from background sources, and the margin of safety. (40 C.F.R. § 130.2(i).) Discharges addressed by this General Permit are considered to be point source discharges, and therefore must comply with effluent limitations that are "consistent with the assumptions and requirements of any available waste load allocation for the discharge prepared by the state and approved by U.S. EPA pursuant to 40 Code of Federal Regulations section 130.7. (40 C.F.R. § 122.44 (d)(1)(vii).) In addition, Water Code section 13263, subdivision (a), requires that waste discharge requirements implement any relevant water quality control plans. Many TMDLs in water quality control plans include implementation requirements in addition to waste load allocations. Attachment E of this General Permit contains the TMDL-specific requirements for watersheds/water bodies with U.S. EPA-approved and U.S. EPA-established TMDLs for Dischargers covered by this General Permit.

39. The State Water Board recognizes the responsibility to develop TMDL-specific permit requirements derived from each TMDL's waste load allocation and implementation requirements, in order for Dischargers to implement and comply with the TMDL. The development of TMDL-specific permit requirements is subject to public noticing requirements and a corresponding public comment period. The amendment to implement TMDLs was a lengthy process due to the number and variety of Dischargers subject to a wide range of TMDLs, and the necessary development of TMDL-specific permit

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- requirements for each TMDL listed in Attachment E. To avoid severely delaying the 2014 reissuance of this General Permit, the State Water Board adopted a subsequent amendment to this General Permit to incorporate TMDLs. The majority of the TMDLs were established by the Regional Water Boards; additionally some of the waste load allocations and/or implementation requirements may be shared by multiple Dischargers. Therefore, the State Water Board development of TMDL-specific permit requirements was coordinated with the applicable Regional Water Boards.
40. State and Regional Water Board staff developed TMDL-specific permit requirements (including monitoring and reporting requirements) for each of the TMDLs listed in Attachment E. After conducting a 30-day public comment period, the Regional Water Boards submitted to the State Water Board the proposed TMDL-specific permit requirements for adoption by the State Water Board into this General Permit. The Regional Water Boards proposed TMDL-specific monitoring requirements for inclusion in this General Permit.
  41. The Regional Water Boards submitted to the State Water Board the following information for each of the TMDLs listed in Attachment E:
    - a. Proposed TMDL-specific permit, monitoring and reporting requirements applicable to industrial storm water discharges and NSWDS authorized under this General Permit, including compliance schedules and deliverables consistent with the TMDLs. TMDL-specific permit requirements are not limited by the BAT/BCT technology-based standards;
    - b. An explanation of how the proposed TMDL-specific permit requirements, compliance schedules, and deliverables were consistent with the assumptions and requirements of any applicable waste load allocation and implement each TMDL; and,
    - c. Where a BMP-based approach was proposed, an explanation of how the proposed BMPs would be sufficient to implement applicable waste load allocations.
  42. Upon receipt of the information described in Finding 41, the State Water Board issued a public notice and conducted a public comment period for the reopening of this General Permit to amend Attachment E, the Fact Sheet, and other provisions as necessary for incorporation of TMDL-specific permit requirements into this General Permit.
  43. Dischargers that are subject to TMDL-specific permit requirements are referred to as “Responsible Dischargers.”
  44. TMDL-specific permit requirements do not apply to Dischargers with NEC coverage or meeting the NONA criteria.

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45. This General Permit's NALs found in Table 2 shall continue to apply to Responsible Dischargers in addition to applicable TMDL Numeric Action Levels (TNALs) and Numeric Effluent Limitations (NELs) in Attachment E Table E-2.
46. The State Water Board Executive Director has the authority to incorporate a reanalyzed Regional Water Board adopted Water Effect Ratio (WER) into this General Permit.
47. Responsible Dischargers shall refer to Section XII.A for the Exceedance Response Actions requirements upon a TNAL exceedance.
48. All TNALs established in Attachment E Table E-2 for TMDL implementation are applied as instantaneous maximum values as defined in Section XII.A.2 and Attachment C of this General Permit. There are no annual TNALs in this General Permit.
49. NELs established in Attachment E Table E-2 for TMDL implementation are applied as instantaneous maximum values as defined in Attachment C of this General Permit. There are no annual NELs in this General Permit.
50. The establishment of instantaneous maximum NELs for TMDL implementation does not change the implementation or definitions of NELs in Attachment F of this General Permit, which contains the 40 Code of Federal Regulations Chapter I Subchapter N (Subchapter N) effluent limitation guidelines approved by U.S. EPA for specific categories of industrial storm water discharges.
51. The State Water Board has added requirements to Attachment E and this General Permit, including this General Permit's Exceedance Response Actions (ERAs) provisions and Water Quality Based Corrective Actions provisions, implementing TMDLs through Permit-specific TMDL requirements. These are collectively referred to as the TMDL Requirements.

### **G. Compliance Options**

52. The State Water Board allows Dischargers statewide to implement an optional Compliance Option in Attachment I, which is hereby incorporated into this Order, as a means of complying with Section V.A and being deemed in compliance with Section III.C (Discharge Prohibitions), Section V.C (Effluent Limitations), and Section VI (Receiving Water Limitations) of this General Permit. Dischargers implementing and in compliance with Attachment I Compliance Option requirements are also exempt from certain provisions of this General Permit as specified in Attachment I, including, but not limited to, Section XII (Exceedance Response Actions). A Discharger deemed in compliance with a provision is not required by this General Permit to take any further action to meet the requirements of that provision. Dischargers are still required to comply with applicable Subchapter N effluent limitations.

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53. The Compliance Options involve implementing BMPs with the effective capacity to capture and use, infiltrate, and/or evapotranspire authorized non-storm water sources defined in Section IV and storm water associated with industrial activities produced up to and during the 85<sup>th</sup> percentile 24-hour precipitation event based upon local, historical precipitation data and records.
54. The Compliance Options allow for the implementation of BMPs either on-site or off-site.
55. The State Water Board is confident that Dischargers implementing a Compliance Option will be in actual compliance with water quality standards in the receiving water as well as with General Permit-specific TMDL requirements; however, the Water Boards retain the authority to require Dischargers to take further action should implementation of a Compliance Option not result in actual compliance with water quality standards in the receiving water and/or to reevaluate the Compliance Option approach in future iterations of this General Permit.<sup>3</sup>
56. The On-Site Compliance Option includes requirements for the protection of groundwater. These requirements are included pursuant to the State Water Board's Porter-Cologne Water Quality Control Act authority in this General Permit (which is an NPDES permit) to avoid the necessity of adopting a separate waste discharge requirement (WDR). NPDES permits issued by the State Water Board also serve as WDRs and may include state-law based requirements. Because these groundwater protection requirements go beyond the scope of NPDES permitting, these requirements are enforceable in accordance with the Porter-Cologne Water Quality Control Act, not the federal Clean Water Act. Further, these groundwater protection requirements are CEQA-exempt; specifically, these requirements are "covered by the general rule that CEQA applies only to projects which have the potential for causing a significant effect on the environment," which applies "[w]here it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment[.]" (Cal. Code Regs., tit. 14, § 15061, subd. (b)(3).) There is no possibility that discharges made in accordance with these requirements will have a significant effect on the environment due to the requirement for Dischargers to protect discharges to groundwater by 1) ensuring all influent entering the infiltration BMPs meet applicable Maximum Contaminant Level (MCL) criteria or proving discharges to groundwater meet MCL criteria, 2) monitoring the BMP influent to verify compliance, and 3) verifying potential impacts and conducting applicable monitoring for a variety of contaminants of concern.

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<sup>3</sup> "Actual compliance" as used here refers to compliance with water quality standards in the receiving water and General Permit-specific TMDL requirements, rather than compliance through Attachment I's "deemed in compliance" provisions.

**Industrial General Permit Order****H. Discharges Subject to the California Ocean Plan**

57. On October 16, 2012 the State Water Board amended the California Ocean Plan. The amended California Ocean Plan requires industrial storm water dischargers with outfalls discharging to ocean waters to comply with the California Ocean Plan's model monitoring provisions. These provisions require Dischargers to: (a) monitor runoff for specific parameters at all outfalls from two storm events per year, and collect at least one representative receiving water sample per year, (b) conduct specified toxicity monitoring at certain types of outfalls at a minimum of once per year, and (c) conduct marine sediment monitoring for toxicity under specific circumstances. The California Ocean Plan provides conditions under which some of the above monitoring provisions may be waived by the Water Boards.
58. This General Permit requires Dischargers with outfalls discharging to ocean waters that are subject to the model monitoring provisions of the California Ocean Plan to develop and implement a monitoring plan in compliance with those provisions and any additional monitoring requirements established pursuant to Water Code section 13383. Dischargers that have not developed and implemented a monitoring program in compliance with the California Ocean Plan's model monitoring provisions by July 1, 2015 (the effective date of this General Permit), or seven (7) days prior to commencing operations, whichever is later, are ineligible to obtain coverage under this General Permit.
59. The California Ocean Plan prohibits the direct discharge of waste to ASBS. ASBS are defined in California Ocean Plan as "those areas designated by the State Water Board as ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable."
60. The California Ocean Plan authorizes the State Water Board to grant an exception to Ocean Plan provisions where the board determines that the exception will not compromise protection of ocean waters for beneficial uses and the public interest will be served.
61. On March 20, 2012, the State Water Board adopted Resolution 2012-0012 which contains exceptions to the California Ocean Plan for specific discharges of storm water and non-point sources. This resolution also contains the special protections that are to be implemented for those discharges to ASBS.
62. This General Permit requires Dischargers who have been granted an exception to the Ocean Plan authorizing the discharges to ASBS by the State Water Board to comply with the requirements contained in Section VIII.B of this General Permit.



**Industrial General Permit Order****I. Training**

63. To improve compliance and maintain consistent implementation of this General Permit, Dischargers are required to designate a Qualified Industrial Storm Water Practitioner (QISP) for each facility the Discharger operates that has entered Level 1 status in the Exceedance Response Action (ERA) process as described in Section XII of this General Permit. A QISP may be assigned to more than one facility. In order to qualify as a QISP, a State Water Board-sponsored or approved training course must be completed. A competency exam may be required by the State Water Board to demonstrate sufficient knowledge of the QISP course material.
64. A QISP must assist the Discharger in completing the Level 1 status and Level 2 status ERA requirements as specified in Section XII of this General Permit. A QISP is also responsible for assisting New Dischargers that will be discharging to an impaired water body with a 303(d) listed impairment, demonstrate eligibility for coverage through preparing the data and/or information required in Section VII.B.
65. A Compliance Group Leader, as defined in Section XIV of this General Order must complete a State Water Board sponsored or approved training program for Compliance Group Leaders.
66. All engineering work subject to the Professional Engineers Act (Bus. & Prof. Code § 6700, et seq.) and required by this General Permit shall be performed by a California licensed professional engineer.
67. California licensed professional civil, industrial, chemical, and mechanical engineers and geologists have licenses that have professional overlap with the topics of this General Permit. The California Department of Consumer Affairs, Board for Professional Engineers, Land Surveyors and Geologists (CBPELSG) provides the licensure and regulation of professional civil, industrial, chemical, and mechanical engineers and professional geologists in California. The State Water Board is developing a specialized self-guided State Water Board-sponsored registration and training program specifically for these CBPELSG licensed engineers and geologists in good standing with CBPELSG.

**J. Storm Water Pollution Prevention Plan (SWPPP) Requirements**

68. This General Permit requires the development of a site-specific SWPPP in accordance with Section X of this General Permit. The SWPPP must include the information needed to demonstrate compliance with the requirements of this General Permit. The SWPPP must be submitted electronically via SMARTS, and a copy be kept at the facility. SWPPP revisions shall be completed in accordance with Section X.B of this General Permit.



**Industrial General Permit Order****K. Sampling, Visual Observations, Reporting and Record Keeping**

69. This General Permit complies with 40 Code of Federal Regulations section 122.44(i), which establishes monitoring requirements that must be included in storm water permits, including requiring the use of sufficiently sensitive U.S. EPA-approved methods, where they exist. Under this General Permit, Dischargers are required to: (a) conduct an Annual Comprehensive Facility Compliance Evaluation (Annual Evaluation) to identify areas of the facility contributing pollutants to industrial storm water discharges, (b) evaluate whether measures to reduce or prevent industrial pollutant loads identified in the Discharger's SWPPP are adequate and properly implemented in accordance with the terms of this General Permit, and (c) determine whether additional control measures are needed.
70. This General Permit contains monitoring requirements that are necessary to determine whether pollutants are being discharged, and whether response actions are necessary. Data and information resulting from the monitoring will assist in Dischargers' evaluations of BMP effectiveness and compliance with this General Permit. Visual observations are one form of monitoring. This General Permit requires Dischargers to perform a variety of visual observations designed to identify pollutants in industrial storm water discharges and their sources. To comply with this General Permit Dischargers shall: (1) electronically self-report any violations via SMARTS, (2) comply with the Level 1 status and Level 2 status ERA requirements, when applicable, and (3) adequately address and respond to any Regional Water Board comments on the Discharger's compliance reports.
71. Dischargers that meet the requirements of the No Exposure Certification (NEC) Conditional Exclusion set forth in Section XVII of this General Permit are exempt from the SWPPP requirements, sampling requirements, and visual observation requirements in this General Permit.

**L. Facilities Subject to Federal Storm Water Effluent Limitation Guidelines (ELGs)**

72. U.S. EPA regulations at 40 Code of Federal Regulations Chapter I Subchapter N (Subchapter N) establish technology-based Effluent Limitation Guidelines and New Source Performance Standards (ELGs) for industrial storm water discharges from facilities in specific industrial categories. For these facilities, compliance with the BAT/BCT and ELG requirements constitutes compliance with technology-based requirements of this General Permit.
73. 40 Code of Federal Regulations section 122.44(i)(3) and (4) require storm water permits to require at least one Annual Evaluation and any monitoring requirements for applicable ELGs in Subchapter N. This General Permit requires Dischargers to comply with all applicable ELG requirements found in Subchapter N.

**Industrial General Permit Order****M. Sampling and Analysis Reduction**

74. This General Permit reduces the number of qualifying sampling events required to be sampled each year when the Discharger demonstrates: (1) consistent compliance with this General Permit, (2) consistent effluent water quality sampling, and (3) analysis results that do not exceed numerical action levels.

**N. Role of Numeric Action Levels (NALs), TMDL Numeric Action Levels (TNALs) and Exceedance Response Actions (ERAs)**

75. This General Permit incorporates a multiple objective performance measurement system that includes NALs, new comprehensive training requirements, Level 1 ERA Reports, Level 2 ERA Technical Reports, and Level 2 ERA Action Plans. Two objectives of the performance measurement system are to inform Dischargers, the public and the Water Boards on: (1) the overall pollutant control performance at any given facility, and (2) the overall performance of the industrial statewide storm water program. Additionally, the State Water Board expects that this information and assessment process will provide information necessary to determine the feasibility of numeric effluent limitations for industrial dischargers in the next reissuance of this General Permit, consistent with the State Water Board Storm Water Panel of Experts' June 2006 Recommendations.<sup>4</sup>

76. This General Permit contains annual and instantaneous maximum NALs. The annual NALs are established as the 2008 MSGP benchmark values, and are applicable for all parameters listed in Table 2. The instantaneous maximum NALs are calculated from a Water Board dataset, and are only applicable for Total Suspended Solids (TSS), Oil and Grease (O&G), and pH. TNAL exceedances are all expressed as instantaneous maximums and are identified in Attachment E Table E-2. An NAL exceedance is determined as follows:

- a. For annual NALs, an exceedance occurs when the average of all analytical results from all samples taken at a facility during a reporting year for a given parameter exceeds an annual NAL value listed in Table 2 of this General Permit; or,
- b. For the instantaneous maximum NALs/TNALs, an exceedance occurs when two or more analytical results from samples taken for any parameter within a reporting year exceed the instantaneous maximum NAL/TNAL value, or are outside of the instantaneous maximum NAL range (for pH)

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<sup>4</sup> State Water Board Storm Water Panel of Experts, [The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities](http://www.swrcb.ca.gov/water_issues/programs/stormwater/docs/numeric/swpanel_final_report.pdf) (June 19, 2006) <[http://www.swrcb.ca.gov/water\\_issues/programs/stormwater/docs/numeric/swpanel\\_final\\_report.pdf](http://www.swrcb.ca.gov/water_issues/programs/stormwater/docs/numeric/swpanel_final_report.pdf)> [as of February 4, 2014].

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listed in Table 2 of this General Permit. For the purposes of this General Permit, the reporting year is July 1 through June 30.

77. The NALs are not intended to serve as technology-based or water quality-based numeric effluent limitations. The NALs are not derived directly from either BAT/BCT requirements or receiving water objectives. The TNALs serve as BMP-based water quality-based effluent limitations. The NAL/TNAL exceedances defined in this General Permit are not, in and of themselves, violations of this General Permit. A Discharger that does not fully comply with the Level 1 status and/or Level 2 status ERA requirements, when required by the terms of this General Permit, is in violation of this General Permit.
78. ERAs are designed to assist Dischargers in complying with this General Permit. Dischargers subject to ERAs must evaluate the effectiveness of their BMPs being implemented to ensure they are adequate to achieve compliance with this General Permit.
79. U.S. EPA regulations at Subchapter N establish ELGs for storm water discharges from facilities in 11 industrial categories. Dischargers subject to these ELGs are required to comply with the applicable requirements.
80. Exceedances of the NALs/TNALs that are attributable solely to pollutants originating from non-industrial pollutant sources (such as run-on from adjacent facilities, non-industrial portions of the Discharger's property, or aerial deposition) are not a violation of this General Permit because the NALs/TNALs are designed to provide feedback on industrial sources of pollutants. Dischargers may submit a Non-Industrial Source Pollutant Demonstration as part of their Level 2 ERA Technical Report to demonstrate that the presence of a pollutant causing an NAL/TNAL exceedance is attributable solely to pollutants originating from non-industrial pollutant sources.
81. A Discharger who has designed, installed, and implemented BMPs to reduce or prevent pollutants in industrial storm water discharges in compliance with this General Permit may submit an Industrial Activity BMPs Demonstration, as part of their Level 2 ERA Technical Report.
82. This General Permit establishes design storm standards for all treatment control BMPs. These design standards are directly based on the standards in State Water Board Order 2000-0011 regarding Standard Urban Storm Water Mitigation Plans (SUSMPs). These design standards are generally expected to be consistent with BAT/BCT, to be protective of water quality, and to be effective for most pollutants. The standards are intended to eliminate the need for most Dischargers to further treat/control industrial storm water discharges that are unlikely to contain pollutant loadings that exceed the NALs set forth in this General Permit.

**Industrial General Permit Order****O. Compliance Groups**

83. Compliance Groups are groups of Dischargers (Compliance Group Participants) that share common types of pollutant sources and industrial activity characteristics. Compliance Groups provide an opportunity for the Compliance Group Participants to combine resources and develop consolidated Level 1 ERA Reports for Level 1 NAL/TNAL exceedances and appropriate BMPs for implementation in response to Level 2 status ERA requirements that are representative of the entire Compliance Group. Compliance Groups also provide the Water Boards and the public with valuable information as to how industrial storm water discharges are affected by non-industrial background pollutant sources (including natural background) and geographic locations. When developing the next reissuance of this General Permit, the State Water Board expects to have a better understanding of the feasibility and benefits of sector-specific and watershed-based permitting alternatives, which may include technology- or water quality-based numeric effluent limitations. The effluent data, BMP performance data and other information provided from Compliance Groups' consolidated reporting will further assist the State Water Board in addressing sector-specific and watershed-based permitting alternatives.

Compliance Groups Participants who are Responsible Dischargers may participate in Compliance Groups with other Responsible Dischargers or Dischargers; however, the Compliance Group Leader is required to indicate which participants are Responsible Dischargers.

**P. Conditional Exclusion – No Exposure Certification (NEC)**

84. Pursuant to U.S. EPA Phase II regulations, all Dischargers subject to this General Permit may qualify for a conditional exclusion from specific requirements if they submit a NEC demonstrating that their facilities have no exposure of industrial activities and materials to storm water discharges.

85. This General Permit requires Dischargers who seek the NEC conditional exclusion to obtain coverage in accordance with Section XVII of this General Permit. Dischargers that meet the requirements of the NEC are exempt from the SWPPP, sampling requirements, and monitoring requirements in this General Permit.

86. Dischargers seeking NEC coverage are required to certify and submit the applicable permit registration documents. Annual inspections, re-certifications, and fees are required in subsequent years. Light industry facility Dischargers excluded from coverage under the previous permit (Order 97-03-DWQ) must obtain the appropriate coverage under this General Permit. Failure to comply with the Conditional Exclusion conditions listed in this General Permit may lead to enforcement for discharging without a permit pursuant to sections 13385 or 13399.25, et seq., of the Water Code. A Discharger with NEC coverage that anticipates a change (or changes) in

## **Industrial General Permit Order**

circumstances that would lead to exposure should register for permit coverage prior to the anticipated changes.

### **Q. Special Requirements for Facilities Handling Plastic Materials**

87. Section 13367 of the Water Code requires facilities handling preproduction plastic to implement specific BMPs aimed at minimizing discharges of such materials. The definition of Plastic Materials for the purposes of this General Permit includes the following types of sources of Plastic Materials: virgin and recycled plastic resin pellets, powders, flakes, powdered additives, regrind, dust, and other types of preproduction plastics with the potential to discharge or migrate off-site.

### **R. Regional Water Board Authorities**

88. Regional Water Boards are primarily responsible for enforcement of this General Permit. This General Permit recognizes that Regional Water Boards have the authority to protect the beneficial uses of receiving waters and prevent degradation of water quality in their region. As such, Regional Water Boards may modify monitoring requirements and review, comment, approve or disapprove certain Discharger submittals required under this General Permit.

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**IT IS HEREBY ORDERED** that all Dischargers subject to this General Permit shall comply with the following conditions and requirements.<sup>5</sup>

**II. RECEIVING GENERAL PERMIT COVERAGE****A. Certification**

1. For Storm Water Multiple Application and Report Tracking System (SMARTS) electronic account management and security reasons, as well as enforceability of this General Permit, the Discharger's Legally Responsible Person (LRP) of an industrial facility seeking coverage under this General Permit shall certify and submit all Permit Registration Documents (PRDs) for Notice of Intent (NOI) or No Exposure Certification (NEC) coverage. All other documents shall be certified and submitted via SMARTS by the Discharger's (LRP) or by their Duly Authorized Representative in accordance with the Electronic Signature and Certification Requirements in Section XXI.K. All documents required by this General Permit that are certified and submitted via SMARTS shall be in accordance with Section XXI.K.
2. Hereinafter references to certifications and submittals by the Discharger refer to the Discharger's LRP and their Duly Authorized Representative.

**B. Coverages**

This General Permit includes requirements for two (2) types of permit coverage, NOI coverage and NEC coverage. State Water Board Order 97-03-DWQ (previous permit) remains in effect until July 1, 2015. When PRDs are certified and submitted and the annual fee is received, the State Water Board will assign the Discharger a Waste Discharger Identification (WDID) number.

1. General Permit Coverage (NOI Coverage)
  - a. Dischargers that discharge storm water associated with industrial activity to waters of the United States are required to meet all applicable requirements of this General Permit.

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<sup>5</sup> Dischargers may implement an optional Compliance Option, as specified in Attachment I, as a means of complying with Section V.A and being deemed in compliance with Section III.C (Discharge Prohibitions), Section V.C (Effluent Limitations), and Section VI (Receiving Water Limitations) of this Order. Dischargers implementing and in compliance with Attachment I Compliance Option requirements are also exempt from certain provisions of this General Permit as specified in Attachment I, including, but not limited to, Section XII (Exceedance Response Actions). Dischargers are still required to comply with applicable Subchapter N effluent limitations.



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- b. The Discharger shall register for coverage under this General Permit by certifying and submitting PRDs via [SMARTS](http://smarts.waterboards.ca.gov) (<http://smarts.waterboards.ca.gov>), which consist of:
    - i. A completed NOI and signed certification statement;
    - ii. A copy of a current Site Map from the Storm Water Pollution Prevention Plan (SWPPP) in Section X.E;
    - iii. A SWPPP (see Section X); and,
  - c. The Discharger shall pay the appropriate Annual Fee in accordance with California Code of Regulations, title 23, section 2200 et seq.<sup>6</sup>
2. General Permit Coverage (NEC Coverage)
- a. Dischargers that certify their facility has no exposure of industrial activities or materials to storm water in accordance with Section XVII qualify for NEC coverage and are not required to comply with the SWPPP or monitoring requirements of this General Permit.
  - b. Dischargers who qualify for NEC coverage shall conduct one Annual Facility Comprehensive Compliance Evaluation (Annual Evaluation) as described in Section XV, pay an annual fee, and certify annually that their facilities continue to meet the NEC requirements.
  - c. The Discharger shall submit the following PRDs on or before October 1, 2015 for NEC coverage via SMARTS:
    - i. A completed NEC Form (Section XVII.F.1) and signed certification statement (Section XVII.H);
    - ii. A completed NEC Checklist (Section XVII.F.2); and
    - iii. A current Site Map consistent with requirements in Section X.E.;
  - d. The Discharger shall pay the appropriate annual fee in accordance with California Code of Regulations, title 23, section 2200 et seq.<sup>7</sup>
3. General PRD Requirements
- a. Site Maps
- Dischargers registering for NOI or NEC coverage shall prepare a site map(s) as part of their PRDs in accordance with Section X.E. A separate

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<sup>6</sup> Annual fees must be mailed or sent electronically using the State Water Boards' Electronic Funds Transfer (EFT) system in SMARTS.

<sup>7</sup> See footnote 4.

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copy of the site map(s) is required to be in the SWPPP. If there is a significant change in the facility layout (e.g., new building, change in storage locations, boundary change, etc.) a revision to the site map is required and shall be certified and submitted via SMARTS.

- b. A Discharger shall submit a single set of PRDs for coverage under this General Permit for multiple industrial activities occurring at the same facility.
  - c. Any information provided to the Water Boards by the Discharger shall comply with the Homeland Security Act and other federal law that addresses security in the United States; any information that does not comply should not be submitted in the PRDs. The Discharger must provide justification to the Regional Water Board regarding redacted information within any submittal.
  - d. Dischargers may redact trade secrets from information that is submitted via SMARTS. Dischargers who certify and submit redacted information via SMARTS must include a general description of the redacted information and the basis for the redaction in the version that is submitted via SMARTS. Dischargers must submit complete and un-redacted versions of the information that are clearly labeled "CONFIDENTIAL" to the Regional Water Board within 30 days of the submittal of the redacted information. All information labeled "CONFIDENTIAL" will be maintained by the Water Boards in a separate, confidential file.
4. Schedule for Submitting PRDs - Existing Dischargers Under the Previous Permit.
- a. Existing Dischargers<sup>8</sup> with coverage under the previous permit shall continue coverage under the previous permit until July 1, 2015. All waste discharge requirements and conditions of the previous permit are in effect until July 1, 2015.
  - b. Existing Dischargers with coverage under the previous permit shall register for NOI coverage by or on August 14, 2015 or for NEC coverage by or on October 1, 2015. The filing date for Existing Dischargers that register for NOI coverage by or on August 14, 2015 shall be deemed July 1, 2015. Existing Dischargers previously listed in Category 10 (Light Industry) of the previous permit, and continue to have no exposure to industrial activities and materials, have until October 1, 2015 to register for NEC coverage.

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<sup>8</sup> Existing Dischargers are Dischargers with an active Notice of Intent (permit coverage) under the previous permit (97-03-DWQ) prior to the effective date of this General Permit.

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- c. Existing Dischargers with coverage under the previous permit, that do not register for NOI coverage by or on August 14, 2015, may have their permit coverage administratively terminated as soon as August 14, 2015.
  - d. Existing Dischargers with coverage under the previous permit that are eligible for NEC coverage but do not register for NEC coverage by October 1, 2015 may have their permit coverage administratively terminated as soon as October 1, 2015.
  - e. Existing Dischargers shall continue to comply with the SWPPP requirements in State Water Board Order 97-03-DWQ up to, but no later than, June 30, 2015.
  - f. Existing Dischargers shall implement an updated SWPPP in accordance with Section X by July 1, 2015.
  - g. Existing Dischargers that submit a Notice of Termination (NOT) under the previous permit prior to July 1, 2015 and that receive NOT approval from the Regional Water Board are not subject to this General Permit unless they subsequently submitted new PRDs.
5. Schedule for Submitting PRDs - New Dischargers Obtaining Coverage On or After July 1, 2015
- a. New Dischargers registering for NOI coverage on or after July 1, 2015 shall certify and submit PRDs via SMARTS at least seven (7) days prior to commencement of industrial activities or on August 14, 2015, whichever comes later. The filing date for New Dischargers that register for NOI coverage by or on August 14, 2015 shall be deemed July 1, 2015 or seven (7) days prior to commencement of industrial activities, whichever comes later.
  - b. New Dischargers registering for NEC coverage shall electronically certify and submit PRDs via SMARTS by October 1, 2015, or at least seven (7) days prior to commencement of industrial activities, whichever is later.

### **C. Termination and Changes to General Permit Coverage**

- 1. Dischargers with NOI or NEC coverage shall request termination of coverage under this General Permit when either (a) operation of the facility has been transferred to another entity, (b) the facility has ceased operations, completed closure activities, and removed all industrial related pollutants, or (c) the facility's operations have changed and are no longer subject to the General Permit. Dischargers shall certify and submit a Notice of Termination via SMARTS. Until a valid NOT is received, the Discharger remains responsible for compliance with this General Permit and payment of accrued annual fees.
- 2. Whenever there is a change to the facility location, the Discharger shall certify and submit new PRDs via SMARTS. When ownership changes, the prior

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Discharger (seller) must inform the new Discharger (buyer) of the General Permit applications and regulatory coverage requirements. The new Discharger must certify and submit new PRDs via SMARTS to obtain coverage under this General Permit.

3. Dischargers with NOI coverage where the facility qualifies for NEC coverage in accordance with Section XVII of this General Permit, may register for NEC coverage via SMARTS. Such Dischargers are not required to submit an NOT to cancel NOI coverage.
4. Dischargers with NEC coverage, where changes in the facility and/or facility operations occur, which result in NOI coverage instead of NEC coverage, shall register for NOI coverage via SMARTS. Such Dischargers are not required to submit an NOT to cancel NEC coverage.
5. Dischargers shall provide additional information supporting an NOT, or revise their PRDs via SMARTS, upon request by the Regional Water Board.
6. Dischargers that are denied approval of a submitted NOT or registration for NEC coverage by the Regional Water Board, shall continue compliance with this General Permit under their existing NOI coverage.
7. New Dischargers (Dischargers with no previous NOI or NEC coverage) shall register for NOI coverage if the Regional Water Board denies NEC coverage.

**D. Preparation Requirements**

1. The following documents shall be certified and submitted by the Discharger via SMARTS:
  - a. Annual Reports (Section XVI) and SWPPPs (Section X);
  - b. NOTs;
  - c. Sampling Frequency Reduction Certification (Section XI.C.7);
  - d. Level 1 ERA Reports (Section XII.C) prepared by a QISP;
  - e. Level 2 ERA Technical Reports and Level 2 ERA Action Plans (Sections XII.D.1-2) prepared by a QISP; and,
  - f. SWPPPs for inactive mining operations as described in Section XIII, signed (wet signature and license number) by a California licensed professional engineer.
2. The following documents shall be signed (wet signature and license number) by a California licensed professional engineer:
  - a. Calculations for Dischargers subject to Subchapter N in accordance with Section XI.D;

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- b. Notice of Non-Applicability (NONA) Technical Reports described in Section XX.C for facilities that are engineered and constructed to have contained the maximum historic precipitation event (or series of events) using the precipitation data collected from the National Oceanic and Atmospheric Agency's website;
- c. NONA Technical Reports described in Section XX.C for facilities located in basins or other physical locations that are not tributaries or hydrologically connected to waters of the United States; and,
- d. SWPPPs for inactive mines described in Section XIII.

**III. DISCHARGE PROHIBITIONS**

- A. All discharges of storm water to waters of the United States are prohibited except as specifically authorized by this General Permit or another NPDES permit.
- B. Except for non-storm water discharges (NSWDs) authorized in Section IV, discharges of liquids or materials other than storm water, either directly or indirectly to waters of the United States, are prohibited unless authorized by another NPDES permit. Unauthorized NSWDs must be either eliminated or authorized by a separate NPDES permit.
- C. Industrial storm water discharges and authorized NSWDs that contain pollutants that cause or threaten to cause pollution, contamination, or nuisance as defined in section 13050 of the Water Code, are prohibited.
- D. Discharges that violate any discharge prohibitions contained in applicable Regional Water Board Water Quality Control Plans (Basin Plans), or statewide water quality control plans and policies are prohibited.
- E. Discharges to ASBS are prohibited in accordance with the California Ocean Plan, unless granted an exception by the State Water Board and in compliance with the Special Protections contained in Resolution 2012-0012.
- F. Industrial storm water discharges and NSWDs authorized by this General Permit that contain hazardous substances equal to or in excess of a reportable quantity listed in 40 Code of Federal Regulations sections 110.6, 117.21, or 302.6 are prohibited.

**IV. AUTHORIZED NON-STORM WATER DISCHARGES (NSWDS)**

- A. The following NSWDS are authorized provided they meet the conditions of Section IV.B:
  - 1. Fire-hydrant and fire prevention or response system flushing;
  - 2. Potable water sources including potable water related to the operation, maintenance, or testing of potable water systems;

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3. Drinking fountain water and atmospheric condensate including refrigeration, air conditioning, and compressor condensate;
4. Irrigation drainage and landscape watering provided all pesticides, herbicides and fertilizers have been applied in accordance with the manufacturer's label;
5. Uncontaminated natural springs, groundwater, foundation drainage, footing drainage;
6. Seawater infiltration where the seawater is discharged back into the source: and,
7. Incidental windblown mist from cooling towers that collects on rooftops or adjacent portions of your facility, but not intentional discharges from the cooling tower (e.g., "piped" cooling tower blowdown or drains).

**B.** The NSWDs identified in Section IV.A are authorized by this General Permit if the following conditions are met:

1. The authorized NSWDs are not in violation of any Regional Water Board Water Quality Control Plans (Basin Plans) or other requirements, or statewide water quality control plans or policies requirement;
2. The authorized NSWDs are not in violation of any municipal agency ordinance or requirements;
3. BMPs are included in the SWPPP and implemented to:
  - a. Reduce or prevent the contact of authorized NSWDs with materials or equipment that are potential sources of pollutants;
  - b. Reduce, to the extent practicable, the flow or volume of authorized NSWDs;
  - c. Ensure that authorized NSWDs do not contain quantities of pollutants that cause or contribute to an exceedance of a water quality standards; and,
  - d. Reduce or prevent discharges of pollutants in authorized NSWDs in a manner that reflects best industry practice considering technological availability and economic practicability and achievability.
4. The Discharger conducts monthly visual observations (Section XI.A.1) of NSWDs and sources to ensure adequate BMP implementation and effectiveness; and,
5. The Discharger reports and describes all authorized NSWDs in the Annual Report.

**C.** Firefighting related discharges are not subject to this General Permit and are not subject to the conditions of Section IV.B. These discharges, however, may be



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subject to Regional Water Board enforcement actions under other sections of the Water Code. Firefighting related discharges that are contained and are later discharged may be subject to municipal agency ordinances and/or Regional Water Board requirements.

**V. EFFLUENT LIMITATIONS**

- A.** Dischargers shall implement BMPs that comply with the BAT/BCT requirements of this General Permit to reduce or prevent discharges of pollutants in their storm water discharge in a manner that reflects best industry practice considering technological availability and economic practicability and achievability.
- B.** Industrial storm water discharges from facilities subject to storm water ELGs in Subchapter N shall not exceed those storm water ELGs. The ELGs for industrial storm water discharges subject to Subchapter N are in Attachment F of this General Permit.
- C.** Dischargers located within a watershed for which a Total Maximum Daily Load (TMDL) has been approved by U.S. EPA, shall comply with any applicable TMDL-specific permit requirements that are set forth in Attachment E.
  - 1. **Numeric Effluent Limitations (NELs):** Responsible Dischargers shall compare all sampling and analytical results obtained from each distinct sampling location (where an individual or combined sample (as authorized by XI.C.5) is obtained from a discharge location(s) to the corresponding instantaneous maximum NEL values in the TMDL Compliance Table E-2. An instantaneous maximum NEL exceedance occurs when two (2) or more analytical results from samples taken for any single parameter within a reporting year exceeds the instantaneous maximum NEL value. For Dischargers using composite sampling or flow-weighted measurements in accordance with standard practices, the average concentration result per sampling location shall be calculated in accordance with the U.S. EPA's NPDES Storm Water Sampling Guidance Document. An exceedance of an NEL is a violation of this General Permit.
  - 2. **TMDL Numeric Action Levels (TNALs):** Responsible Dischargers shall compare all sampling and analytical results obtained from each distinct sampling location (where an individual or combined sample (as authorized by XI.C.5) is obtained from a discharge location(s)) to the corresponding instantaneous maximum TNAL values in the TMDL Compliance Table E-2. An instantaneous maximum TNAL exceedance occurs when two (2) or more analytical results from samples taken for any single parameter within a reporting year exceeds the instantaneous maximum TNAL value. For Dischargers using composite sampling or flow-weighted measurements in accordance with standard practices, the average concentration result per sampling location shall be calculated in accordance with the U.S. EPA's NPDES Storm Water Sampling Guidance Document. An exceedance of a TNAL is not a violation of this General Permit, though it does require implementation of Exceedance Response Actions.

**Industrial General Permit Order****VI. RECEIVING WATER LIMITATIONS**

- A.** Dischargers shall ensure that industrial storm water discharges and authorized NSWDS do not cause or contribute to an exceedance of any applicable water quality standards in any affected receiving water.
- B.** Dischargers shall ensure that industrial storm water discharges and authorized NSWDS do not adversely affect human health or the environment.
- C.** Dischargers shall ensure that industrial storm water discharges and authorized NSWDS do not contain pollutants in quantities that threaten to cause pollution or a public nuisance.

**VII. TOTAL MAXIMUM DAILY LOADS (TMDLs)****A. Implementation**

- 1. The State Water Board reopened and amended this General Permit, including Attachment E, the Fact Sheet and other applicable Permit provisions as necessary, in order to incorporate TMDL-specific permit requirements, as described in the Findings, Section I.F. Dischargers shall comply with the incorporated TMDL-specific requirements in accordance with any specified compliance schedule(s) starting on the Effective Date of the TMDL Requirements. TMDL-specific compliance dates that exceed the term of this General Permit may be included for reference, and are enforceable in the event that this General Permit is administratively extended or reissued.
- 2. The State Water Board has the discretion to reopen this General Permit to add TMDL-specific permit requirements to Attachment E, or to incorporate new TMDLs adopted during the term of this General Permit that include requirements applicable to Dischargers covered by this General Permit.
- 3. The TMDL-specific requirements are shown in the TMDL Compliance Table E-2, in Attachment E of this General Permit.

**B. New Dischargers applying for NOI coverage under this General Permit that will be discharging to a water body with a 303(d) listed impairment are ineligible for coverage unless the Discharger submits data and/or information, prepared by a QISP, demonstrating that:**

- 1. The Discharger has eliminated all exposure to storm water of the pollutant(s) for which the water body is impaired, has documented the procedures taken to prevent exposure onsite, and has retained such documentation with the SWPPP at the facility;
- 2. The pollutant for which the water body is impaired is not present at the Discharger's facility, and the Discharger has retained documentation of this finding with the SWPPP at the facility; or,

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3. The discharge of any listed pollutant will not cause or contribute to an exceedance of a water quality standard. This is demonstrated if: (1) the discharge complies with the water quality standard at the point of discharge, or (2) if the discharge is controlled at least as stringently as similar discharges subject to that TMDL.

**C. TMDL Monitoring and Reporting**

1. The Responsible Discharger is required to perform sampling, analysis, and reporting in accordance with the requirements of this General Permit, and additional monitoring required in the TMDL Compliance Table E-2 in Attachment E of this General Permit.
2. The Responsible Discharger shall compare all sampling and analytical results from each sample (individual or combined as authorized by Section XI.C.5) to the corresponding TNAL or NEL values in the TMDL Compliance Table E-2 in Attachment E of this General Permit.
3. The Responsible Discharger is required to calculate, track, and report applicable TNAL or NEL exceedances. The SWPPP is required to be amended with the TNAL or NEL exceedance information, and to be certified and submitted via SMARTS. SMARTS does not calculate a Responsible Discharger's Level status when a TNAL is exceeded.

**D. Exceedance Response Actions**

1. The Responsible Discharger is required to follow the Exceedance Response Action requirements in Section XII of this General Permit when its discharge exceeds a TNAL.
2. The Responsible Discharger retains the same ERA Level status until July 1 following the Effective Date of the TMDL Requirements.
3. The Responsible Discharger with Level 1 or Level 2 status due to a TNAL exceedance is required to incorporate exceedance-related information into its required ERA reports in accordance with Section XII of this General Permit.

**E.** Responsible Dischargers with an NEL exceedance are in violation of this General Permit and must comply with the Water Quality Based Corrective Actions, as defined in this General Permit in Section XX.B. Responsible Dischargers implementing Water Quality Based Corrective Actions are also required to continue complying with the NALs in this General Permit and perform ERAs as necessary for Table 2 exceedances.

**F.** Responsible Dischargers in compliance with an NEL for a TMDL in Attachment E are in compliance with the receiving water limitations for the water body-pollutant combination addressed by the NEL.

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- G.** Responsible Dischargers with discharges that do not exceed the level of a TNAL for a TMDL in Attachment E are in compliance with the receiving water limitations for the water body-pollutant combination addressed by the TNAL.

**VIII. DISCHARGES SUBJECT TO THE CALIFORNIA OCEAN PLAN****A. Discharges to Ocean Waters**

1. Dischargers with outfalls discharging to ocean waters that are subject to the model monitoring provisions of the California Ocean Plan shall develop and implement a monitoring plan in compliance with those provisions and any additional monitoring requirements established pursuant to Water Code section 13383. Dischargers who have not developed and implemented a monitoring program in compliance with the California Ocean Plan's model monitoring provisions by July 1, 2015, or seven (7) days prior to commencing of operations, whichever is later, are ineligible to obtain coverage under this General Permit.
2. Dischargers are ineligible for the methods and exceptions provided in Section XI.C of this General permit for any of the outfalls discharging to ocean waters subject to the model monitoring provisions of the California Ocean Plan.

**B. Discharge Granted an Exceptions for Areas of Special Biological Significance (ASBS)**

Dischargers who were granted an exception to the California Ocean Plan prohibition against direct discharges of waste to an ASBS pursuant to Resolution 2012-0012<sup>9</sup> amended by Resolution 2012-0031<sup>10</sup> shall comply with the conditions and requirements set forth in Attachment G of this General Permit. Any Discharger that applies for and is granted an exception to the California Ocean Plan prohibition after July 1, 2013 shall comply with the conditions and requirements set forth in the granted exception.

**IX. TRAINING QUALIFICATIONS****A. General**

1. A Qualified Industrial Storm Water Practitioner (QISP) is a person (either the Discharger or a person designated by the Discharger) who has completed a

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<sup>9</sup> State Water Resources Control Board. [Resolution 2012-0012](http://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2012/rs2012_0012.pdf). <[http://www.waterboards.ca.gov/board\\_decisions/adopted\\_orders/resolutions/2012/rs2012\\_0012.pdf](http://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2012/rs2012_0012.pdf)>. [as of February 4, 2014].

<sup>10</sup> State Water Resources Control Board. [Resolution 2012-0031](http://www.swrcb.ca.gov/board_decisions/adopted_orders/resolutions/2012/rs2012_0031.pdf). <[http://www.swrcb.ca.gov/board\\_decisions/adopted\\_orders/resolutions/2012/rs2012\\_0031.pdf](http://www.swrcb.ca.gov/board_decisions/adopted_orders/resolutions/2012/rs2012_0031.pdf)>. [as of February 4, 2014].

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State Water Board-sponsored or approved QISP training course<sup>11</sup>, and has registered as a QISP via SMARTS. Upon completed registration the State Water Board will issue a QISP identification number.

2. The Executive Director of the State Water Board or an Executive Officer of a Regional Water Board may rescind any QISP's registration if it is found that the QISP has repeatedly demonstrated an inadequate level of performance in completing the QISP requirements in this General Permit. An individual whose QISP registration has been rescinded may request that the State Water Board review the rescission. Any request for review must be received by the State Water Board no later than 30 days of the date that the individual received written notice of the rescission.
3. Dischargers with Level 1 status shall:
  - a. Designate a person to be the facility's QISP and ensure that this person has attended and satisfactorily completed the State Water Board-sponsored or approved QISP training course.
  - b. Ensure that the facility's designated QISP provides sufficient training to the appropriate team members assigned to perform activities required by this General Permit.

**X. Storm Water Pollution Prevention Plan (SWPPP)****A. SWPPP Elements**

Dischargers shall develop and implement a site-specific SWPPP for each industrial facility covered by this General Permit that shall contain the following elements, as described further in this Section<sup>12</sup>:

1. Facility Name and Contact Information;
2. Site Map;
3. List of Industrial Materials;
4. Description of Potential Pollution Sources;
5. Assessment of Potential Pollutant Sources;

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<sup>11</sup> A specialized self-guided State Water Board-sponsored registration and training program will be available as an option for CPBELSG licensed professional civil, mechanical, industrial, and chemical engineers and professional geologists by the effective date of this General Permit.

<sup>12</sup> Appendix 1 (SWPPP Checklist) of this General Permit is provided to assist the Discharger in including information required in the SWPPP. This checklist is not required to be used.

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6. Minimum BMPs;
7. Advanced BMPs, if applicable;
8. Monitoring Implementation Plan;
9. Annual Comprehensive Facility Compliance Evaluation (Annual Evaluation);  
and,
10. Date that SWPPP was Initially Prepared and the Date of Each SWPPP  
Amendment, if Applicable.

**B. SWPPP Implementation and Revisions**

All Dischargers are required to implement their SWPPP by July 1, 2015 or upon commencement of industrial activity. The Discharger shall:

1. Revise their on-site SWPPP whenever necessary;
2. Certify and submit via SMARTS their SWPPP within 30 days whenever the SWPPP contains significant revision(s); and,
3. With the exception of significant revisions, the Discharger is not required to certify and submit via SMARTS their SWPPP revisions more than once every three (3) months in the reporting year.

**C. SWPPP Performance Standards**

1. The Discharger shall ensure a SWPPP is prepared to:
  - a. Identify and evaluate all sources of pollutants that may affect the quality of industrial storm water discharges and authorized NSWDS;
  - b. Identify and describe the minimum BMPs (Section X.H.1) and any advanced BMPs (Section X.H.2) implemented to reduce or prevent pollutants in industrial storm water discharges and authorized NSWDS. BMPs shall be selected to achieve compliance with this General Permit;  
and,
  - c. Identify and describe conditions or circumstances which may require future revisions to be made to the SWPPP.
2. The Discharger shall prepare a SWPPP in accordance with all applicable SWPPP requirements of this Section. A copy of the SWPPP shall be maintained at the facility.



**Industrial General Permit Order****D. Planning and Organization****1. Pollution Prevention Team**

Each facility must have a Pollution Prevention Team established and responsible for assisting with the implementation of the requirements in this General Permit. The Discharger shall include in the SWPPP detailed information about its Pollution Prevention Team including:

- a. The positions within the facility organization (collectively, team members) who assist in implementing the SWPPP and conducting all monitoring requirements in this General Permit;
- b. The responsibilities, duties, and activities of each of the team members; and,
- c. The procedures to identify alternate team members to implement the SWPPP and conduct required monitoring when the regularly assigned team members are temporarily unavailable (due to vacation, illness, out of town business, or other absences).

**2. Other Requirements and Existing Facility Plans**

- a. The Discharger shall ensure its SWPPP is developed, implemented, and revised as necessary to be consistent with any applicable municipal, state, and federal requirements that pertain to the requirements in this General Permit.
- b. The Discharger may include in their SWPPP the specific elements of existing plans, procedures, or regulatory compliance documents that contain storm water-related BMPs or otherwise relate to the requirements of this General Permit.
- c. The Discharger shall properly reference the original sources for any elements of existing plans, procedures, or regulatory compliance documents included as part of their SWPPP and shall maintain a copy of the documents at the facility as part of the SWPPP.
- d. The Discharger shall document in their SWPPP the facility's scheduled operating hours as defined in Attachment C. Scheduled facility operating hours that would be considered irregular (temporary, intermittent, seasonal, weather dependent, etc.) shall also be documented in the SWPPP.

**E. Site Map**

1. The Discharger shall prepare a site map that includes notes, legends, a north arrow, and other data as appropriate to ensure the map is clear, legible and understandable.

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2. The Discharger may provide the required information on multiple site maps.
3. The Discharger shall include the following information on the site map:
  - a. The facility boundary, storm water drainage areas within the facility boundary, and portions of any drainage area impacted by discharges from surrounding areas. Include the flow direction of each drainage area, on-facility surface water bodies, areas of soil erosion, and location(s) of nearby water bodies (such as rivers, lakes, wetlands, etc.) or municipal storm drain inlets that may receive the facility's industrial storm water discharges and authorized NSWDS;
  - b. Locations of storm water collection and conveyance systems, associated discharge locations, and direction of flow. Include any sample locations if different than the identified discharge locations;
  - c. Locations and descriptions of structural control measures<sup>13</sup> that affect industrial storm water discharges, authorized NSWDS, and/or run-on;
  - d. Identification of all impervious areas of the facility, including paved areas, buildings, covered storage areas, or other roofed structures;
  - e. Locations where materials are directly exposed to precipitation and the locations where identified significant spills or leaks (Section X.G.1.d) have occurred; and
  - f. Areas of industrial activity subject to this General Permit. Identify all industrial storage areas and storage tanks, shipping and receiving areas, fueling areas, vehicle and equipment storage/maintenance areas, material handling and processing areas, waste treatment and disposal areas, dust or particulate generating areas, cleaning and material reuse areas, and other areas of industrial activity that may have potential pollutant sources.

**F. List of Industrial Materials**

The Discharger shall ensure the SWPPP includes a list of industrial materials handled at the facility, and the locations where each material is stored, received, shipped, and handled, as well as the typical quantities and handling frequency.

**G. Potential Pollutant Sources**

1. Description of Potential Pollutant Sources
  - a. Industrial Processes

The Discharger shall ensure the SWPPP describes each industrial process including: manufacturing, cleaning, maintenance, recycling,

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<sup>13</sup> Examples of structural control measures are catch basins, berms, detention ponds, secondary containment, oil/water separators, diversion barriers, etc.

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disposal, generation of by products (including, but not limited to, air particulate emissions), and any other activities related to the process. The type, characteristics, and approximate quantity of industrial materials used in or resulting from the process shall be included. Areas protected by containment structures and the corresponding containment capacity shall be identified and described.

b. Material Handling and Storage Areas

The Discharger shall ensure the SWPPP describes each material handling and storage area, including: the type, characteristics, and quantity of industrial materials handled or stored; the shipping, receiving, and loading procedures; the spill or leak prevention and response procedures; and the areas protected by containment structures and the corresponding containment capacity.

c. Dust and Particulate Generating Activities

The Discharger shall ensure the SWPPP describes all industrial activities that generate a significant amount of dust or particulate that may be deposited within the facility boundaries. The SWPPP shall describe such industrial activities, including the discharge locations, the source type, and the characteristics of the dust or particulate pollutant. The Discharger shall ensure the SWPPP identifies any industrial activities and areas that are associated with other regulations or regulated by other permits (including, but not limited to, air quality permits) with the potential to expose pollutants to storm water.

d. Significant Spills and Leaks

The Discharger shall:

i. Evaluate the facility for areas where spills and leaks can likely occur;

ii. Ensure the SWPPP includes:

a) A list of any industrial materials that have spilled or leaked in significant quantities and have discharged from the facility's storm water conveyance system within the previous five-year period;

b) A list of any toxic chemicals identified in 40 Code of Federal Regulations section 302 that have been discharged from the facilities' storm water conveyance system as reported on U.S. EPA Form R, as well as oil and hazardous substances in excess of reportable quantities (40 C.F.R. §§ 110, 117, and 302) that have discharged from the facility's storm water conveyance system within the previous five-year period;

c) A list of any industrial materials that have spilled or leaked in significant quantities and had the potential to be discharged from

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the facility's storm water conveyance system within the previous five-year period; and,

- iii. Ensure that for each discharge or potential discharge listed above the SWPPP includes the location, characteristics, and approximate quantity of the materials spilled or leaked; approximate quantity of the materials discharged from the facility's storm water conveyance system; the cleanup or remedial actions that have occurred or are planned; the approximate remaining quantity of materials that have the potential to be discharged; and the preventive measures taken to ensure spills or leaks of the material do not reoccur.

e. NSWDs

The Discharger shall:

- i. Ensure the SWPPP includes an evaluation of the facility that identifies all NSWDs, sources, and drainage areas;
- ii. Ensure the SWPPP includes an evaluation of all drains (inlets and outlets) that identifies connections to the storm water conveyance system;
- iii. Ensure the SWPPP includes a description of how all unauthorized NSWDs have been eliminated; and,
- iv. Ensure all NSWDs are described in the SWPPP. This description shall include the source, quantity, frequency, and characteristics of the NSWDs, associated drainage area, and whether it is an authorized or unauthorized NSWd in accordance with Section IV.

f. Erodible Surfaces

The Discharger shall ensure the SWPPP includes a description of the facility locations where soil erosion may be caused by industrial activity, contact with storm water, authorized and unauthorized NSWDs, or run-on from areas surrounding the facility.

2. Assessment of Potential Pollutant Sources

- a. The Discharger shall ensure that the SWPPP includes a narrative assessment of all areas of industrial activity with potential industrial pollutant sources. At a minimum, the assessment shall include:
  - i. The areas of the facility with likely sources of pollutants in industrial storm water discharges and authorized NSWDs;
  - ii. The pollutants likely to be present in industrial storm water discharges and authorized NSWDs;

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- iii. The approximate quantity, physical characteristics (e.g., liquid, powder, solid, etc.), and locations of each industrial material handled, produced, stored, recycled, or disposed;
  - iv. The degree to which the pollutants associated with those materials may be exposed to, and mobilized by contact with, storm water;
  - v. The direct and indirect pathways by which pollutants may be exposed to storm water or authorized NSWDS;
  - vi. All sampling, visual observation, and inspection records;
  - vii. The effectiveness of existing BMPs to reduce or prevent pollutants in industrial storm water discharges and authorized NSWDS;
  - viii. The estimated effectiveness of implementing, to the extent feasible, minimum BMPs to reduce or prevent pollutants in industrial storm water discharges and authorized NSWDS; and,
  - ix. The identification of the industrial pollutants related to the receiving waters with 303(d) listed impairments identified in Appendix 3 or approved TMDLs that may be causing or contributing to an exceedance of a water quality standard in the receiving waters.
- b. Based upon the assessment above, Dischargers shall identify in the SWPPP any areas of the facility where the minimum BMPs described in subsection H.1 below will not adequately reduce or prevent pollutants in storm water discharges in compliance with Section V.A. Dischargers shall identify any advanced BMPs, as described in subsection H.2 below, for those areas.
  - c. Based upon the assessment above, Dischargers shall identify any drainage areas with no exposure to industrial activities and materials in accordance with the definitions in Section XVII.
  - d. Based upon the assessment above, Dischargers shall identify any additional parameters, beyond the required parameters in Section XI.B.6 that indicate the presence of pollutants in industrial storm water discharges.

**Industrial General Permit Order****H. Best Management Practices (BMPs)****1. Minimum BMPs**

The Discharger shall, to the extent feasible, implement and maintain all of the following minimum BMPs to reduce or prevent pollutants in industrial storm water discharges.<sup>14</sup>

**a. Good Housekeeping**

The Discharger shall:

- i. Observe all outdoor areas associated with industrial activity; including storm water discharge locations, drainage areas, conveyance systems, waste handling/disposal areas, and perimeter areas impacted by off-facility materials or storm water run-on to determine housekeeping needs. Any identified debris, waste, spills, tracked materials, or leaked materials shall be cleaned and disposed of properly;
- ii. Minimize or prevent material tracking;
- iii. Minimize dust generated from industrial materials or activities;
- iv. Ensure that all facility areas impacted by rinse/wash waters are cleaned as soon as possible;
- v. Cover all stored industrial materials that can be readily mobilized by contact with storm water;
- vi. Contain all stored non-solid industrial materials or wastes (e.g., particulates, powders, shredded paper, etc.) that can be transported or dispersed by the wind or contact with storm water;
- vii. Prevent disposal of any rinse/wash waters or industrial materials into the storm water conveyance system;
- viii. Minimize storm water discharges from non-industrial areas (e.g., storm water flows from employee parking area) that contact industrial areas of the facility; and,
- ix. Minimize authorized NSWDS from non-industrial areas (e.g., potable water, fire hydrant testing, etc.) that contact industrial areas of the facility.

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<sup>14</sup> For the purposes of this General Permit, the requirement to implement BMPs “to the extent feasible” requires Dischargers to select, design, install and implement BMPs that reduce or prevent discharges of pollutants in their storm water discharge in a manner that reflects best industry practice considering technological availability and economic practicability and achievability.



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b. Preventive Maintenance

The Discharger shall:

- i. Identify all equipment and systems used outdoors that may spill or leak pollutants;
- ii. Observe the identified equipment and systems to detect leaks, or identify conditions that may result in the development of leaks;
- iii. Establish an appropriate schedule for maintenance of identified equipment and systems; and,
- iv. Establish procedures for prompt maintenance and repair of equipment, and maintenance of systems when conditions exist that may result in the development of spills or leaks.

c. Spill and Leak Prevention and Response

The Discharger shall:

- i. Establish procedures and/or controls to minimize spills and leaks;
- ii. Develop and implement spill and leak response procedures to prevent industrial materials from discharging through the storm water conveyance system. Spilled or leaked industrial materials shall be cleaned promptly and disposed of properly;
- iii. Identify and describe all necessary and appropriate spill and leak response equipment, location(s) of spill and leak response equipment, and spill or leak response equipment maintenance procedures; and,
- iv. Identify and train appropriate spill and leak response personnel.

d. Material Handling and Waste Management

The Discharger shall:

- i. Prevent or minimize handling of industrial materials or wastes that can be readily mobilized by contact with storm water during a storm event;
- ii. Contain all stored non-solid industrial materials or wastes (e.g., particulates, powders, shredded paper, etc.) that can be transported or dispersed by the wind or contact with storm water;
- iii. Cover industrial waste disposal containers and industrial material storage containers that contain industrial materials when not in use;
- iv. Divert run-on and storm water generated from within the facility away from all stockpiled materials;

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- v. Clean all spills of industrial materials or wastes that occur during handling in accordance with the spill response procedures (Section X.H.1.c); and,
  - vi. Observe and clean as appropriate, any outdoor material or waste handling equipment or containers that can be contaminated by contact with industrial materials or wastes.
- e. Erosion and Sediment Controls

For each erodible surface facility location identified in the SWPPP (Section X.G.1.f), the Discharger shall:

- i. Implement effective wind erosion controls;
  - ii. Provide effective stabilization for inactive areas, finished slopes, and other erodible areas prior to a forecasted storm event;
  - iii. Maintain effective perimeter controls and stabilize all site entrances and exits to sufficiently control discharges of erodible materials from discharging or being tracked off the site;
  - iv. Divert run-on and storm water generated from within the facility away from all erodible materials; and,
  - v. If sediment basins are implemented, ensure compliance with the design storm standards in Section X.H.6.
- f. Employee Training Program

The Discharger shall:

- i. Ensure that all team members implementing the various compliance activities of this General Permit are properly trained to implement the requirements of this General Permit, including but not limited to: BMP implementation, BMP effectiveness evaluations, visual observations, and monitoring activities. If a Discharger enters Level 1 status, appropriate team members shall be trained by a QISP;
- ii. Prepare or acquire appropriate training manuals or training materials;
- iii. Identify which personnel need to be trained, their responsibilities, and the type of training they shall receive;
- iv. Provide a training schedule; and,
- v. Maintain documentation of all completed training classes and the personnel that received training in the SWPPP.

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g. Quality Assurance and Record Keeping

The Discharger shall:

- i. Develop and implement management procedures to ensure that appropriate staff implements all elements of the SWPPP, including the Monitoring Implementation Plan;
- ii. Develop a method of tracking and recording the implementation of BMPs identified in the SWPPP; and
- iii. Maintain the BMP implementation records, training records, and records related to any spills and clean-up related response activities for a minimum of five (5) years (Section XXI.J.4).

2. Advanced BMPs

- a. In addition to the minimum BMPs described in Section X.H.1, the Discharger shall, to the extent feasible, implement and maintain any advanced BMPs identified in Section X.G.2.b, necessary to reduce or prevent discharges of pollutants in its storm water discharge in a manner that reflects best industry practice considering technological availability and economic practicability and achievability.

- b. Advanced BMPs may include one or more of the following BMPs:

- i. Exposure Minimization BMPs

These include storm resistant shelters (either permanent or temporary) that prevent the contact of storm water with the identified industrial materials or area(s) of industrial activity.

- ii. Storm Water Containment and Discharge Reduction BMPs

These include BMPs that divert, infiltrate, reuse, contain, retain, or reduce the volume of storm water runoff. Dischargers are encouraged to utilize BMPs that infiltrate or reuse storm water where feasible.

- iii. Treatment Control BMPs

This is the implementation of one or more mechanical, chemical, biologic, or any other treatment technology that will meet the treatment design standard.

- iv. Other Advanced BMPs

Any additional BMPs not described in subsections b.i through iii above that are necessary to meet the effluent limitations of this General Permit.

**Industrial General Permit Order****3. Temporary Suspension of Industrial Activities**

For facilities that plan to temporarily suspend industrial activities for ten (10) or more consecutive calendar days during a reporting year, the Discharger may also suspend monitoring if it is infeasible to conduct monitoring while industrial activities are suspended (e.g., the facility is not staffed, or the facility is remote or inaccessible) and the facility has been stabilized. The Discharger shall include in the SWPPP the BMPs necessary to achieve compliance with this General Permit during the temporary suspension of the industrial activity. Once all necessary BMPs have been implemented to stabilize the facility, the Discharger is not required to:

- a. Perform monthly visual observations (Section XI.A.1.a.); or,
- b. Perform sampling and analysis (Section XI.B.) if it is infeasible to do so (e.g. facility is remotely located).

The Discharger shall upload via SMARTS (7) seven calendar days prior to the planned temporary suspension of industrial activities:

- a. SWPPP revisions specifically addressing the facility stabilization BMPs;
- b. The justification for why monitoring is infeasible at the facility during the period of temporary suspension of industrial activities;
- c. The date the facility is fully stabilized for temporary suspension of industrial activities; and,
- d. The projected date that industrial activities will resume at the facility.

Upon resumption of industrial activities at the facility, the Discharger shall, via SMARTS, confirm and/or update the date the facility's industrial activities have resumed. At this time, the Discharger is required to resume all compliance activities under this General Permit.

The Regional Water Boards may review the submitted information pertaining to the temporary suspension of industrial activities. Upon review, the Regional Water Board may request revisions or reject the Discharger's request to temporarily suspend monitoring.

**4. BMP Descriptions**

- a. The Discharger shall ensure that the SWPPP identifies each BMP being implemented at the facility, including:
  - i. The pollutant(s) that the BMP is designed to reduce or prevent in industrial storm water discharges;
  - ii. The frequency, time(s) of day, or conditions when the BMP is scheduled for implementation;

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- iii. The locations within each area of industrial activity or industrial pollutant source where the BMP shall be implemented;
  - iv. The individual and/or position responsible for implementing the BMP;
  - v. The procedures, including maintenance procedures, and/or instructions to implement the BMP effectively;
  - vi. The equipment and tools necessary to implement the BMP effectively; and,
  - vii. The BMPs that may require more frequent visual observations beyond the monthly visual observations as described in Section XI.A.1.
- b. The Discharger shall ensure that the SWPPP identifies and justifies each minimum BMP or applicable advanced BMP not being implemented at the facility because they do not reflect best industry practice considering technological availability and economic practicability and achievability.
  - c. The Discharger shall identify any BMPs described in subsection a above that are implemented in lieu of any of the minimum or applicable advanced BMPs.

**5. BMP Summary Table**

The Discharger shall prepare a table summarizing each identified area of industrial activity, the associated industrial pollutant sources, the industrial pollutants, and the BMPs being implemented.

**6. Design Storm Standards for Treatment Control BMPs**

All new treatment control BMPs employed by the Discharger to comply with Section X.H.2 Advanced BMPs and new sediment basins installed after the effective date of this order shall be designed to comply with design storm standards in this Section, except as provided in an Industrial Activity BMP Demonstration (Section XII.D.2.a). A Factor of Safety shall be incorporated into the design of all treatment control BMPs to ensure that storm water is sufficiently treated throughout the life of the treatment control BMPs. The design storm standards for treatment control BMPs are as follows:

- a. Volume-based BMPs: The Discharger, at a minimum, shall calculate<sup>15</sup> the volume to be treated using one of the following methods:
  - i. The volume of runoff produced from an 85<sup>th</sup> percentile 24-hour storm event, as determined from local, historical rainfall records;

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<sup>15</sup> All hydrologic calculations shall be certified by a California licensed professional engineer in accordance with the Professional Engineers Act (Bus. & Prof. Code § 6700, et seq).

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- ii. The volume of runoff produced by the 85<sup>th</sup> percentile 24-hour storm event, determined as the maximized capture runoff volume for the facility, from the formula recommended in the Water Environment Federation's Manual of Practice;<sup>16</sup> or,
  - iii. The volume of annual runoff required to achieve 80% or more treatment, determined in accordance with the methodology set forth in the latest edition of California Stormwater Best Management Practices Handbook<sup>17</sup>, using local, historical rainfall records.
- b. Flow-based BMPs: The Discharger shall calculate the flow needed to be treated using one of the following methods:
  - i. The maximum flow rate of runoff produced from a rainfall intensity of at least 0.2 inches per hour for each hour of a storm event;
  - ii. The maximum flow rate of runoff produced by the 85<sup>th</sup> percentile hourly rainfall intensity, as determined from local historical rainfall records, multiplied by a factor of two; or,
  - iii. The maximum flow rate of runoff, as determined using local historical rainfall records, that achieves approximately the same reduction in total pollutant loads as would be achieved by treatment of the 85<sup>th</sup> percentile hourly rainfall intensity multiplied by a factor of two.

**I. MONITORING IMPLEMENTATION PLAN**

The Discharger shall prepare a Monitoring Implementation Plan in accordance with the requirements of this General Permit. The Monitoring Implementation Plan shall be included in the SWPPP and shall include the following items:

- 1. An identification of team members assigned to conduct the monitoring requirements;
- 2. A description of the following in accordance with Attachment H:
  - a. Discharge locations;
  - b. Visual observation procedures; and,

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<sup>16</sup> Water Environment Federation (WEF). Manual of Practice No. 23/ ASCE Manual of Practice No. 87, cited in chapter 5 (1998 Edition) and Cited in Chapter 3 (2012 Edition).

<sup>17</sup> California Stormwater Quality Association. Stormwater Best Management Practice New Development and Redevelopment Handbook. <<http://www.casqa.org/>>. [as of July 3, 2013].



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- c. Visual observation response procedures related to monthly visual observations and sampling event visual observations.
3. Justifications for any of the following that are applicable to the facility:
  - a. Alternative discharge locations in accordance with Section XI.C.3;
  - b. Representative Sampling Reduction in accordance with Section XI.C.4; or,
  - c. Qualified Combined Samples in accordance with Section XI.C.5.
4. Procedures for field instrument calibration instructions, including calibration intervals specified by the manufacturer; and,
5. An example Chain of Custody form used when handling and shipping water quality samples to the lab.

## **XI. MONITORING**

### **A. Visual Observations**

1. Monthly Visual Observations
  - a. At least once per calendar month, the Discharger shall visually observe each drainage area for the following:
    - i. The presence or indications of prior, current, or potential unauthorized NSWDS and their sources;
    - ii. Authorized NSWDS, sources, and associated BMPs to ensure compliance with Section IV.B.3; and,
    - iii. Outdoor industrial equipment and storage areas, outdoor industrial activities areas, BMPs, and all other potential source of industrial pollutants.
  - b. The monthly visual observations shall be conducted during daylight hours of scheduled facility operating hours and on days without precipitation.
  - c. The Discharger shall provide an explanation in the Annual Report for uncompleted monthly visual observations.

### **2. Sampling Event Visual Observations**

Sampling event visual observations shall be conducted at the same time sampling occurs at a discharge location. At each discharge location where a sample is obtained, the Discharger shall observe the discharge of storm water associated with industrial activity.

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- a. The Discharger shall ensure that visual observations of storm water discharged from containment sources (e.g. secondary containment or storage ponds) are conducted at the time that the discharge is sampled.
  - b. Any Discharger employing volume-based or flow-based treatment BMPs shall sample any bypass that occurs while the visual observations and sampling of storm water discharges are conducted.
  - c. The Discharger shall visually observe and record the presence or absence of floating and suspended materials, oil and grease, discolorations, turbidity, odors, trash/debris, and source(s) of any discharged pollutants.
  - d. In the event that a discharge location is not visually observed during the sampling event, the Discharger shall record which discharge locations were not observed during sampling or that there was no discharge from the discharge location.
  - e. The Discharger shall provide an explanation in the Annual Report for uncompleted sampling event visual observations.
3. Visual Observation Records

The Discharger shall maintain records of all visual observations. Records shall include the date, approximate time, locations observed, presence and probable source of any observed pollutants, name of person(s) that conducted the observations, and any response actions and/or additional SWPPP revisions necessary in response to the visual observations.

4. The Discharger shall revise BMPs as necessary when the visual observations indicate pollutant sources have not been adequately addressed in the SWPPP.

### **B. Sampling and Analysis**

1. A Qualifying Storm Event (QSE) is a precipitation event that:
  - a. Produces a discharge for at least one drainage area; and,
  - b. Is preceded by 48 hours with no discharge from any drainage area.
2. The Discharger shall collect and analyze storm water samples from two (2) QSEs within the first half of each reporting year (July 1 to December 31), and two (2) QSEs within the second half of each reporting year (January 1 to June 30).
3. Compliance Group Participants are only required to collect and analyze storm water samples from one (1) QSE within the first half of each reporting year (July 1 to December 31) and one (1) QSE within the second half of the reporting year (January 1 to June 30).

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4. Except as provided in Section XI.C.4 (Representative Sampling Reduction), samples shall be collected from each drainage area at all discharge locations. The samples must be:
  - a. Representative of storm water associated with industrial activities and any commingled authorized NSWDS; or,
  - b. Associated with the discharge of contained storm water.
5. Samples from each discharge location shall be collected within four (4) hours of:
  - a. The start of the discharge; or,
  - b. The start of facility operations if the QSE occurs within the previous 12-hour period (e.g., for storms with discharges that begin during the night for facilities with day-time operating hours). Sample collection is required during scheduled facility operating hours and when sampling conditions are safe in accordance with Section XI.C.6.a.ii.
6. The Discharger shall analyze all collected samples for the following parameters:
  - a. Total suspended solids (TSS) and oil and grease (O&G);
  - b. pH (see Section XI.C.2);
  - c. Additional parameters identified by the Discharger on a facility-specific basis that serve as indicators of the presence of all industrial pollutants identified in the pollutant source assessment (Section X.G). These additional parameters may be modified (added or removed) in accordance with any updated SWPPP pollutant source assessment;
  - d. Additional applicable parameters listed in Table 1 below. These parameters are dependent on the facility Standard Industrial Classification (SIC) code(s);
  - e. Additional applicable industrial parameters related to receiving waters with 303(d) listed impairments or approved TMDLs based on the assessment in Section X.G.2.a.ix. Test methods with lower detection limits may be necessary when discharging to receiving waters with 303(d) listed impairments or TMDLs;
  - f. Additional parameters required by the Regional Water Board. The Discharger shall contact its Regional Water Board to determine appropriate analytical test methods for parameters not listed in Table 2 below. These analytical test methods will be added to SMARTS; and
  - g. For discharges subject to Subchapter N, additional parameters specifically required by Subchapter N. If the discharge is subject to ELGs, the

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Dischargers shall contact the Regional Water Board to determine appropriate analytical methods for parameters not listed in Table 2 below.

7. The Discharger shall select corresponding NALs, analytical test methods,, and reporting units from the list provided in Table 2 below. SMARTS will be updated over time to add additional acceptable analytical test methods. Dischargers may propose an analytical test method for any parameter or pollutant that does not have an analytical test method specified in Table 2 or in SMARTS. Dischargers may also propose analytical test methods with substantially similar or more stringent method detection limits than existing approved analytical test methods. Upon approval, the analytical test method will be added to SMARTS.
8. The Discharger shall ensure that the collection, preservation and handling of all storm water samples are in accordance with Attachment H, Storm Water Sample Collection and Handling Instructions.
9. Samples from different discharge locations shall not be combined or composited except as allowed in Section XI.C.5 (Qualified Combined Samples).
10. The Discharger shall ensure that all laboratory analyses are performed according to sufficiently sensitive test procedures and conducted according to test procedures under 40 Code of Federal Regulations part 136, including the observation of holding times, unless other test procedures have been specified in this General Permit, by the Regional Water Board, or are required under 40 Code of Federal Regulations Chapter I Subchapter N.
11. Sampling Analysis Reporting
  - a. The Discharger shall submit all sampling and analytical results for all individual or Qualified Combined Samples via SMARTS within 30 days of obtaining all results for each sampling event.
  - b. The Discharger shall provide the method detection limit when an analytical result from samples taken is reported by the laboratory as a "non-detect" or less than the method detection limit. A value of zero shall not be reported.
  - c. The Discharger shall provide the analytical result from samples taken that is reported by the laboratory as below the minimum level (often referred to as the reporting limit) but above the method detection limit.

Reported analytical results derived from sufficiently sensitive testing methods will be averaged automatically by SMARTS. For any calculations required by this General Permit, SMARTS will assign a value of zero (0) for all results less than the minimum level as reported by the laboratory after verifying the use of a sufficiently sensitive testing method (as evidenced by reported MDL and ML).

**Industrial General Permit Order****TABLE 1: Additional Analytical Parameters**

<b>SIC code</b>	<b>SIC code Description</b>	<b>Parameters*</b>
102X	Copper Ores	COD; N+N
12XX	Coal Mines	Al; Fe
144X	Sand and Gravel	N+N
207X	Fats and Oils	BOD; COD; N+N
2421	Sawmills & Planning Mills	COD; Zn
2426	Hardwood Dimension	COD
2429	Special Product Sawmills	COD
243X	Millwork, Veneer, Plywood	COD
244X	Wood Containers	COD
245X	Wood Buildings & Mobile Homes	COD
2491	Wood Preserving	As; Cu
2493	Reconstituted Wood Products	COD
263X	Paperboard Mills	COD
281X	Industrial Inorganic Chemicals	Al; Fe; N+N
282X	Plastic Materials, Synthetics	Zn
284X	Soaps, Detergents, Cosmetics	N+N; Zn
287X	Fertilizers, Pesticides, etc.	Fe; N+N; Pb; Zn; P
301X	Tires, Inner Tubes	Zn
302X	Rubber and Plastic Footwear	Zn
305X	Rubber & Plastic Sealers & Hoses	Zn
306X	Misc. Fabricated Rubber Products	Zn
325X	Structural Clay Products	Al
326X	Pottery & Related Products	Al
3297	Non-Clay Refractories	Al
327X	Concrete, Gypsum, Plaster Products (Except 3274)	Fe
3295	Minerals & Earths	Fe
331X	Steel Works, Blast Furnaces, Rolling and Finishing Mills	Al; Zn
332X	Iron and Steel Foundries	Al; Cu; Fe; Zn
335X	Metal Rolling, Drawing, Extruding	Cu; Zn
336X	Nonferrous Foundries (Castings)	Cu; Zn
34XX	Fabricated Metal Products (Except 3479)	Zn; N+N; Fe; Al
3479	Coating and Engraving	Zn; N+N
4953	Hazardous Waste Facilities	NH <sub>3</sub> ; Mg; COD; As; Cn; Pb; HG; Se; Ag
44XX	Water Transportation	Al; Fe; Pb; Zn
45XX	Air Transportation Facilities <sup>18</sup>	BOD; COD; NH <sub>3</sub>

<sup>18</sup> Only airports (SIC 4512-4581) where a single Discharger, or a combination of permitted facilities use more than 100,000 gallons of glycol-based deicing chemicals and/or 100 tons or more of urea on an average annual basis, are required to monitor

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<b>SIC code</b>	<b>SIC code Description</b>	<b>Parameters*</b>
4911	Steam Electric Power Generating Facilities	Fe
4953	Landfills and Land Application Facilities	Fe
5015	Dismantling or Wrecking Yards	Fe; Pb; Al
5093	Scrap and Waste Materials (not including source-separated recycling)	Fe; Pb; Al; Zn; COD

**\*Table 1 Parameter Reference**

<b>Ag</b> – Silver	<b>Mg</b> – Magnesium
<b>Al</b> – Aluminum	<b>N+N</b> - Nitrate & Nitrite Nitrogen
<b>As</b> – Arsenic	<b>NH</b> – Ammonia
<b>BOD</b> – Biochemical Oxygen Demand	<b>Ni</b> – Nickel
<b>Cd</b> - Cadmium	<b>P</b> – Phosphorus
<b>Cn</b> – Cyanide	<b>Se</b> – Selenium
<b>COD</b> – Chemical Oxygen Demand	<b>TSS</b> – Total Suspended Solids
<b>Cu</b> – Copper	<b>Zn</b> – Zinc
<b>Fe</b> – Iron	<b>Pb</b> – Lead
<b>Hg</b> – Mercury	

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these parameters for those outfalls that collect runoff from areas where deicing activities occur.



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**TABLE 2: Parameter NAL Values, Test Methods, and Reporting Units**

PARAMETER	TEST METHOD	REPORTING UNITS	ANNUAL NAL	INSTANTANEOUS MAXIMUM NAL
pH*	See Section XI.C.2	pH units	N/A	Less than 6.0 Greater than 9.0
Suspended Solids (TSS)*, Total	SM 2540-D	mg/L	100	400
Oil & Grease (O&G)*, Total	EPA 1664A	mg/L	15	25
Zinc, Total (H)	EPA 200.8	mg/L	0.26**	n/a***
Copper, Total (H)	EPA 200.8	mg/L	0.0332**	n/a***
Cyanide, Total	SM 4500–CN C, D, or E	mg/L	0.022	n/a***
Lead, Total (H)	EPA 200.8	mg/L	0.262**	n/a***
Chemical Oxygen Demand (COD)	SM 5220C	mg/L	120	n/a***
Aluminum, Total	EPA 200.8	mg/L	0.75	n/a***
Iron, Total	EPA 200.7	mg/L	1.0	n/a***
Nitrate + Nitrite Nitrogen	SM 4500-NO3-E	mg/L as N	0.68	n/a***
Total Phosphorus	SM 4500-P B+E	mg/L as P	2.0	n/a***
Ammonia (as N)	SM 4500-NH3 B+ C or E	mg/L	2.14	n/a***
Magnesium, total	EPA 200.7	mg/L	0.064	n/a***
Arsenic, Total (c)	EPA 200.8	mg/L	0.15	n/a***
Cadmium, Total (H)	EPA 200.8	mg/L	0.0053**	n/a***
Nickel, Total (H)	EPA 200.8	mg/l	1.02**	n/a***
Mercury, Total	EPA 245.1	mg/L	0.0014	n/a***
Selenium, Total	EPA 200.8	mg/L	0.005	n/a***
Silver, Total (H)	EPA 200.8	mg/L	0.0183**	n/a***
Biochemical Oxygen Demand (BOD)	SM 5210B	mg/L	30	n/a***

SM – Standard Methods for the Examination of Water and Wastewater, 18th edition

EPA – U.S. EPA test methods

(H) – Hardness dependent

\* Minimum parameters required by this General Permit

\*\* The NAL is the highest value used by U.S. EPA based on their hardness table in the 2008 MSGP.

\*\*\* [Note: these cells were included for website accessibility reasons to create a complete table.]

**Industrial General Permit Order****C. Methods and Exceptions**

1. The Discharger shall comply with the monitoring methods in this General Permit and Attachment H.
2. pH Methods
  - a. Dischargers that are not subject to Subchapter N ELGs mandating pH analysis related to acidic or alkaline sources and have never entered Level 1 status for pH, are eligible to screen for pH using wide range litmus pH paper or other equivalent pH test kits. The pH screen shall be performed as soon as practicable, but no later than 15 minutes after the sample is collected.
  - b. Dischargers subject to Subchapter N ELGs shall either analyze samples for pH using methods in accordance with 40 Code of Federal Regulations 136 for testing storm water or use a calibrated portable instrument for pH.
  - c. Dischargers that enter Level 1 status (see Section XII.C) for pH shall, in the subsequent reporting years, analyze for pH using methods in accordance with 40 Code of Federal Regulations 136 or use a calibrated portable instrument for pH.
  - d. Dischargers using a calibrated portable instrument for pH shall ensure that all field measurements are conducted in accordance with the accompanying manufacturer's instructions.
3. Alternative Discharge Locations
  - a. The Discharger is required to identify, when practicable, alternative discharge locations for any discharge locations identified in accordance with Section XI.B.4 if the facility's discharge locations are:
    - i. Affected by storm water run-on from surrounding areas that cannot be controlled; and/or,
    - ii. Difficult to observe or sample (e.g. submerged discharge outlets, dangerous discharge location accessibility).
  - b. The Discharger shall submit and certify via SMARTS any alternative discharge location or revisions to the alternative discharge locations in the Monitoring Implementation Plan.
4. Representative Sampling Reduction
  - a. The Discharger may reduce the number of locations to be sampled in each drainage area (e.g., roofs with multiple downspouts, loading/unloading areas with multiple storm drains) if the industrial activities, BMPs, and physical characteristics (grade, surface materials, etc.) of the drainage area for each location to be sampled are substantially

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similar to one another. To qualify for the Representative Sampling Reduction, the Discharger shall provide a Representative Sampling Reduction justification in the Monitoring Implementation Plan section of the SWPPP.

- b. The Representative Sampling Reduction justification shall include:
    - i. Identification and description of each drainage area and corresponding discharge location(s);
    - ii. A description of the industrial activities that occur throughout the drainage area;
    - iii. A description of the BMPs implemented in the drainage area;
    - iv. A description of the physical characteristics of the drainage area;
    - v. A rationale that demonstrates that the industrial activities and physical characteristics of the drainage area(s) are substantially similar; and,
    - vi. An identification of the discharge location(s) selected for representative sampling, and rationale demonstrating that the selected location(s) to be sampled are representative of the discharge from the entire drainage area.
  - c. A Discharger that satisfies the conditions of subsection 4.b.i through v above shall submit and certify via SMARTS the revisions to the Monitoring Implementation Plan that includes the Representative Sampling Reduction justification.
  - d. Upon submittal of the Representative Sampling Reduction justification, the Discharger may reduce the number of locations to be sampled in accordance with the Representative Sampling Reduction justification. The Regional Water Board may reject the Representative Sampling Reduction justification and/or request additional supporting documentation. In such instances, the Discharger is ineligible for the Representative Sampling Reduction until the Regional Water Board approves the Representative Sampling Reduction justification.
5. Qualified Combined Samples
- a. The Discharger may authorize an analytical laboratory to combine samples of equal volume from as many as four (4) discharge locations if the industrial activities, BMPs, and physical characteristics (grade, surface materials, etc.) within each of the drainage areas are substantially similar to one another.

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- b. The Qualified Combined Samples justification shall include:
    - i. Identification and description of each drainage area and corresponding discharge locations;
    - ii. A description of the BMPs implemented in the drainage area;
    - iii. A description of the industrial activities that occur throughout the drainage area;
    - iv. A description of the physical characteristics of the drainage area; and,
    - v. A rationale that demonstrates that the industrial activities and physical characteristics of the drainage area(s) are substantially similar.
  - c. A Discharger that satisfies the conditions of subsection 5.b.i through iv above shall submit and certify via SMARTS the revisions to the Monitoring Implementation Plan that includes the Qualified Combined Samples justification.
  - d. Upon submittal of the Qualified Combined Samples justification revisions in the Monitoring Implementation Plan, the Discharger may authorize the lab to combine samples of equal volume from as many as four (4) drainage areas. The Regional Water Board may reject the Qualified Combined Samples justification and/or request additional supporting documentation. In such instances, the Discharger is ineligible for the Qualified Combined Samples justification until the Regional Water Board approves the Qualified Combined Samples justification.
  - e. Regional Water Board approval is necessary to combine samples from more than four (4) discharge locations.
6. Sample Collection and Visual Observation Exceptions
- a. Sample collection and visual observations are not required under the following conditions:
    - i. During dangerous weather conditions such as flooding or electrical storms; or,
    - ii. Outside of scheduled facility operating hours. The Discharger is not precluded from collecting samples or conducting visual observations outside of scheduled facility operating hours.
  - b. In the event that samples are not collected, or visual observations are not conducted in accordance with Section XI.B.5 due to these exceptions, an explanation shall be included in the Annual Report.

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- c. Sample collection is not required for drainage areas with no exposure to industrial activities and materials in accordance with the definitions in Section XVII.

**7. Sampling Frequency Reduction Certification**

- a. Dischargers are eligible to reduce the number of QSEs sampled each reporting year in accordance with the following requirements:
  - i. Results from four (4) consecutive QSEs that were sampled (QSEs may be from different reporting years) did not exceed any NALs/TNALs/NELs as defined in Section XII.A and Section V.D; and
  - ii. The Discharger is in full compliance with the requirements of this General Permit and has updated, certified and submitted via SMARTS all documents, data, and reports required by this General Permit during the time period in which samples were collected.
- b. The Regional Water Board may notify a Discharger that it may not reduce the number of QSEs sampled each reporting year if the Discharger is subject to an enforcement action.
- c. An eligible Discharger shall certify via SMARTS that it meets the conditions in subsection 7.a above.
- d. Upon Sampling Frequency Reduction certification, the Discharger shall collect and analyze samples from one (1) QSE within the first half of each reporting year (July 1 to December 31), and one (1) QSE within the second half of each reporting year (January 1 to June 30). All other monitoring, sampling, and reporting requirements remain in effect.
- e. Dischargers who participate in a Compliance Group and certify a Sampling Frequency Reduction are only required to collect and analyze storm water samples from one (1) QSE within each reporting year.
- f. A Discharger may reduce sampling per the Sampling Frequency Reduction certification unless notified by the Regional Water Board that: (1) the Sampling Frequency Reduction certification has been rejected or (2) additional supporting documentation must be submitted. In such instances, a Discharger is ineligible for the Sampling Frequency Reduction until the Regional Water Board provides Sampling Frequency Reduction certification approval. Revised Sampling Frequency Reduction certifications shall be certified and submitted via SMARTS by the Discharger.
- g. A Discharger loses its Sampling Frequency Reduction certification if an NAL/TNAL/NEL exceedance occurs (Section XII.A and Section V.D.).

**Industrial General Permit Order****D. Facilities Subject to Federal Storm Water Effluent Limitation Guidelines (ELGs)**

1. In addition to the other requirements in this General Permit, Dischargers with facilities subject to storm water ELGs in Subchapter N shall:
  - a. Collect and analyze samples from QSEs for each regulated pollutant specified in the appropriate category in Subchapter N as specified in Section XI.B;
  - b. For Dischargers with facilities subject to 40 Code of Federal Regulations parts 419<sup>19</sup> and 443<sup>20</sup>, estimate or calculate the volume of industrial storm water discharges from each drainage area subject to the ELGs and the mass of each regulated pollutant as defined in parts 419 and 443; and,
  - c. Ensure that the volume/mass estimates or calculations required in subsection b are completed by a California licensed professional engineer.
2. Dischargers subject to Subchapter N shall submit the information in Section XI.D.1.a through c in their Annual Report.
3. Dischargers with facilities subject to storm water ELGs in Subchapter N are ineligible for the Representative Sampling Reduction in Section XI.C.4.

**XII. EXCEEDANCE RESPONSE ACTIONS (ERAs)****A. Exceedance of an NAL or TNAL**

The Discharger shall perform sampling, analysis and reporting in accordance with the requirements of this General Permit and shall compare the results to the two types of NAL values in Table 2 to determine whether either type of NAL has been exceeded for each applicable parameter, and shall additionally compare the results to any applicable TNAL found in Attachment E Table E-2 to determine whether a TNAL has been exceeded for each applicable parameter.<sup>21</sup> The two types of potential NAL exceedances are as follows:

1. Annual NAL exceedance: The Discharger shall determine the average concentration for each parameter using the results of all the sampling and analytical results for the entire facility for the reporting year (i.e., all "effluent" data). The Discharger shall compare the average concentration for each parameter to the corresponding annual NAL values in Table 2. For

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<sup>19</sup> Part 419 - Petroleum refining point source category

<sup>20</sup> Part 443 - Effluent limitations guidelines for existing sources and standards of performance and pretreatment standards for new sources for the paving and roofing materials (tars and asphalt) point source category

<sup>21</sup> TNALs are implemented as instantaneous maximum values. Annual exceedances are not applicable to TNALs.



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Dischargers using composite sampling or flow-weighted measurements in accordance with standard practices, the average concentrations shall be calculated in accordance with the U.S. EPA's NPDES Storm Water Sampling Guidance Document.<sup>22</sup> An annual NAL exceedance occurs when the average of all the analytical results for a parameter from samples taken within a reporting year exceeds the annual NAL value for that parameter listed in Table 2; and,

2. Instantaneous maximum NAL/TNAL exceedance: The Discharger shall compare all sampling and analytical results from each distinct sample (individual or combined as authorized by XI.C.5) to the corresponding instantaneous maximum NAL values in Table 2 and TNAL values in Attachment E Table E-2. An instantaneous maximum NAL/TNAL exceedance occurs when two (2) or more analytical results from samples taken for any single parameter within a reporting year exceed the instantaneous maximum NAL/TNAL value or are outside of the instantaneous maximum NAL range for pH.

**B. Baseline Status**

At the beginning of a Discharger's NOI Coverage, all Dischargers have Baseline status for all parameters. Upon the effective date of the TMDL Requirements, Responsible Dischargers have Baseline status for all applicable TNALs if 1) the industrial storm water has not previously been sampled for the parameter, or 2) if the Discharger has Baseline status for the NAL for the same parameter.<sup>23</sup>

**C. Level 1 Status**

A Discharger's Baseline status for any given parameter shall change to Level 1 status if sampling results indicate an NAL/TNAL exceedance for that same parameter. Level 1 status will commence on July 1 following the reporting year during which the exceedance(s) occurred.<sup>24</sup> Upon the effective date of the TMDL Requirements, Responsible Dischargers have Level 1 status for any applicable TNAL if the Discharger has Level 1 status for the NAL for the same parameter.<sup>25</sup>

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<sup>22</sup> U.S. EPA. [NPDES Storm Water Sampling Guidance Document](http://www.epa.gov/npdes/pubs/owm0093.pdf). <<http://www.epa.gov/npdes/pubs/owm0093.pdf>>. [as of February 4, 2014]

<sup>23</sup> Following this initial assignment, this General Permit's NALs and TNALs operate independently.

<sup>24</sup> For all sampling results reported before June 30th of the preceding reporting year. If sample results indicating an NAL exceedance are submitted after June 30<sup>th</sup>, the Discharger will change status once those results have been reported.

<sup>25</sup> Following this initial assignment, this General Permit's NALs and TNALs operate independently.

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**1. Level 1 ERA Evaluation**

- a. By October 1 following commencement of Level 1 status for any parameter with sampling results indicating an NAL/TNAL exceedance, the Discharger shall:
- b. Complete an evaluation, with the assistance of a QISP, of the industrial pollutant sources at the facility that are or may be related to the NAL/TNAL exceedance(s); and,
- c. Identify in the evaluation the corresponding BMPs in the SWPPP and any additional BMPs and SWPPP revisions necessary to prevent future NAL/TNAL exceedances and to comply with the requirements of this General Permit. Although the evaluation may focus on the drainage areas where the NAL/TNAL exceedance(s) occurred, all drainage areas shall be evaluated.

**2. Level 1 ERA Report**

- a. Based upon the above evaluation, the Discharger shall, as soon as practicable but no later than January 1 following commencement of Level 1 status:
  - i. Revise the SWPPP as necessary and implement any additional BMPs identified in the evaluation;
  - ii. Certify and submit via SMARTS a Level 1 ERA Report prepared by a QISP that includes the following:
    - 1) A summary of the Level 1 ERA Evaluation required in subsection C.1 above; and,
    - 2) A detailed description of the SWPPP revisions and any additional BMPs for each parameter that exceeded an NAL/TNAL.
  - iii. Certify and submit via SMARTS the QISP's identification number, name, and contact information (telephone number, e-mail address).
- b. A Discharger's Level 1 status for a parameter will return to Baseline status once a Level 1 ERA report has been completed, all identified additional BMPs have been implemented, and results from four (4) consecutive QSEs that were sampled subsequent to BMP implementation indicate no additional NAL/TNAL exceedances for that parameter.

**3. NAL/TNAL Exceedances Prior to Implementation of Level 1 Status BMPs.**

Prior to the implementation of an additional BMP identified in the Level 1 ERA Evaluation or October 1, whichever comes first, sampling results for any parameter(s) being addressed by that additional BMP will not be included in

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the calculations of annual average or instantaneous maximum NAL/TNAL exceedances in SMARTS.

**D. Level 2 Status**

A Discharger's Level 1 status for any given parameter shall change to Level 2 status if sampling results indicate an NAL/TNAL exceedance for that same parameter while the Discharger is in Level 1. Level 2 status will commence on July 1 following the reporting year during which the NAL/TNAL exceedance(s) occurred.<sup>26</sup> Upon the effective date of the TMDL Requirements, Responsible Dischargers have Level 2 status for any applicable TNAL if the Discharger has Level 2 status for the NAL for the same parameter.<sup>27</sup>

**1. Level 2 ERA Action Plan**

- a. Dischargers with Level 2 status shall certify and submit via SMARTS a Level 2 ERA Action Plan prepared by a QISP that addresses each new Level 2 NAL/TNAL exceedance by January 1 following the reporting year during which the NAL/TNAL exceedance(s) occurred. For each new Level 2 NAL/TNAL exceedance, the Level 2 Action Plan will identify which of the demonstrations in subsection D.2.a through c the Discharger has selected to perform. A new Level 2 NAL/TNAL exceedance is any Level 2 NAL/TNAL exceedance for 1) a new parameter in any drainage area, or 2) the same parameter that is being addressed in an existing Level 2 ERA Action Plan in a different drainage area.
- b. The Discharger shall certify and submit via SMARTS the QISP's identification number, name, and contact information (telephone number, e-mail address) if this information has changed since previous certifications.
- c. The Level 2 ERA Action Plan shall at a minimum address the drainage areas with corresponding Level 2 NAL/TNAL exceedances.
- d. All elements of the Level 2 ERA Action Plan shall be implemented as soon as practicable and completed no later than 1 year after submitting the Level 2 ERA Action Plan.
- e. The Level 2 ERA Action Plan shall include a schedule and a detailed description of the tasks required to complete the Discharger's selected demonstration(s) as described below in Section D.2.a through c.

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<sup>26</sup> For all sampling results reported before June 30th of the preceding reporting year. If sample results indicating an NAL exceedance are submitted after June 30<sup>th</sup>, the Discharger will change status upon the date those results have been reported into SMARTS.

<sup>27</sup> Following this initial assignment, this General Permit's NALs and TNALs operate independently.

**Industrial General Permit Order****2. Level 2 ERA Technical Report**

On January 1 of the reporting year following the submittal of the Level 2 ERA Action Plan, a Discharger with Level 2 status shall certify and submit a Level 2 ERA Technical Report prepared by a QISP that includes one or more of the following demonstrations:

**a. Industrial Activity BMPs Demonstration**

This shall include the following requirements, as applicable:

- i. Shall include a description of the industrial pollutant sources and corresponding industrial pollutants that are or may be related to the NAL/TNAL exceedance(s);
- ii. Shall include an evaluation of all pollutant sources associated with industrial activity that are or may be related to the NAL/TNAL exceedance(s);
- iii. Where all of the Discharger's implemented BMPs, including additional BMPs identified in the Level 2 ERA Action Plan, achieve compliance with the effluent limitations of this General Permit and are expected to eliminate future NAL/TNAL exceedance(s), the Discharger shall provide a description and analysis of all implemented BMPs;
- iv. In cases where all of the Discharger's implemented BMPs, including additional BMPs identified in the Level 2 ERA Action Plan, achieve compliance with the effluent limitations of this General Permit but are not expected to eliminate future NAL/TNAL exceedance(s), the Discharger shall provide, in addition to a description and analysis of all implemented BMPs:
  - 1) An evaluation of any additional BMPs that would reduce or prevent NAL/TNAL exceedances;
  - 2) Estimated costs of the additional BMPs evaluated; and,
  - 3) An analysis describing the basis for the selection of BMPs implemented in lieu of the additional BMPs evaluated but not implemented.
- v. The description and analysis of BMPs required in subsection a.iii above shall specifically address the drainage areas where the NAL/TNAL exceedance(s) responsible for the Discharger's Level 2 status occurred, although any additional Level 2 ERA Action Plan BMPs may be implemented for all drainage areas; and,
- vi. If an alternative design storm standard for treatment control BMPs (in lieu of the design storm standard for treatment control BMPs in Section X.H.6 in this General Permit) will achieve compliance with the

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effluent limitations of this General Permit, the Discharger shall provide an analysis describing the basis for the selection of the alternative design storm standard.

b. Non-Industrial Pollutant Source Demonstration

This shall include:

- i. A statement that the Discharger has determined that the exceedance of the NAL/TNAL is attributable solely to the presence of non-industrial pollutant sources. (The pollutant may also be present due to industrial activities, in which case the Discharger must demonstrate that the pollutant contribution from the industrial activities by itself does not result in an NAL/TNAL exceedance.) The sources shall be identified as either run-on from adjacent properties, aerial deposition from man-made sources, or as generated by on-site non-industrial sources;
- ii. A statement that the Discharger has identified and evaluated all potential pollutant sources that may have commingled with storm water associated with the Discharger's industrial activity and may be contributing to the NAL/TNAL exceedance;
- iii. A description of any on-site industrial pollutant sources and corresponding industrial pollutants that are contributing to the NAL/TNAL exceedance;
- iv. An assessment of the relative contributions of the pollutant from (1) storm water run-on to the facility from adjacent properties or non-industrial portions of the Discharger's property or from aerial deposition and (2) the storm water associated with the Discharger's industrial activity;
- v. A summary of all existing BMPs for that parameter; and,
- vi. An evaluation of all on-site/off-site analytical monitoring data demonstrating that the NAL/TNAL exceedances are caused by pollutants in storm water run-on to the facility from adjacent properties or non-industrial portions of the Discharger's property or from aerial deposition.

c. Natural Background Pollutant Source Demonstration

This shall include:

- i. A statement that the Discharger has determined that the NAL/TNAL exceedance is attributable solely to the presence of the pollutant in the natural background that has not been disturbed by industrial activities. (The pollutant may also be present due to industrial activities, in which case the Discharger must demonstrate that the pollutant contribution

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from the industrial activities by itself does not result in an NAL/TNAL exceedance);

- ii. A summary of all data previously collected by the Discharger, or other identified data collectors, that describes the levels of natural background pollutants in the storm water discharge;
- iii. A summary of any research and published literature that relates the pollutants evaluated at the facility as part of the Natural Background Source Demonstration;
- iv. Map showing the reference site location in relation to facility along with available land cover information;
- v. Reference site and test site elevation;
- vi. Available geology and soil information for reference and test sites;
- vii. Photographs showing site vegetation;
- viii. Site reconnaissance survey data regarding presence of roads, outfalls, or other human-made structures; and,
- ix. Records from relevant state or federal agencies indicating no known mining, forestry, or other human activities upstream of the proposed reference site.

### 3. Level 2 ERA Technical Report Submittal

- a. The Discharger shall certify and submit via SMARTS the Level 2 ERA Technical Report described in Section D.2 above.
- b. The State Water Board and Regional Boards (Water Boards) may review the submitted Level 2 ERA Technical Reports. Upon review of a Level 2 ERA Technical Report, the Water Boards may reject the Level 2 ERA Technical Report and direct the Discharger to take further action(s) to comply with this General Permit.
- c. Dischargers with Level 2 status who have submitted the Level 2 ERA Technical Report are only required to annually update the Level 2 ERA Technical Report based upon additional NAL/TNAL exceedances of the same parameter and same drainage area (if the original Level 2 ERA Technical Report contained an Industrial Activity BMP Demonstration and the implemented BMPs were expected to eliminate future NAL/TNAL exceedances in accordance with Section XII.D.2.a.ii), facility operational changes, pollutant source(s) changes, and/or information that becomes available via compliance activities (monthly visual observations, sampling results, annual evaluation, etc.). The Level 2 ERA Technical Report shall be prepared by a QISP and be certified and submitted via SMARTS by the Discharger with each Annual Report. If there are no changes prompting



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an update of the Level 2 ERA Technical Report, as specified above, the Discharger will provide this certification in the Annual Report that there have been no changes warranting re-submittal of the Level 2 ERA Technical Report.

- d. Dischargers are not precluded from submitting a Level 2 ERA Action Plan or ERA Technical Report prior to entering Level 2 status if information is available to adequately prepare the report and perform the demonstrations described above. A Discharger who chooses to submit a Level 2 ERA Action Plan or ERA Technical Report prior to entering Level 2 status will automatically be placed in Level 2 in accordance to the Level 2 ERA schedule.

#### 4. Eligibility for Returning to Baseline Status

- a. Dischargers with Level 2 status who submit an Industrial Activity BMPs Demonstration in accordance with subsection 2.a.i through iii above and have implemented BMPs to prevent future NAL/TNAL exceedance(s) for the Level 2 parameter(s) shall return to baseline status for that parameter, if results from four (4) subsequent consecutive QSEs sampled indicate no additional NAL/TNAL exceedance(s) for that parameter(s). If future NAL/TNAL exceedances occur for the same parameter(s), the Discharger's Baseline status will return to Level 2 status on July 1 in the subsequent reporting year during which the NAL/TNAL exceedance(s) occurred. These Dischargers shall update the Level 2 ERA Technical Report as required above in Section D.3.c.
- b. Dischargers are ineligible to return to baseline status if they submit any of the following:
  - i. industrial activity BMP demonstration in accordance with subsection 2.a.iv above;
  - ii. An non-industrial pollutant source demonstration; or,
  - iii. A natural background pollutant source demonstration.

#### 5. Level 2 ERA Implementation Extension

- a. Dischargers that need additional time to submit the Level 2 ERA Technical Report shall be automatically granted a single time extension for up to six (6) months upon submitting the following items into SMARTS, as applicable:
  - i. Reasons for the time extension;
  - ii. A revised Level 2 ERA Action Plan including a schedule and a detailed description of the necessary tasks still to be performed to complete the Level 2 ERA Technical Report; and

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- iii. A description of any additional temporary BMPs that will be implemented while permanent BMPs are being constructed.
- b. The Regional Water Boards will review Level 2 ERA Implementation Extensions for completeness and adequacy. Requests for extensions that total more than six (6) months are not granted unless approved in writing by the Water Boards. The Water Boards may (1) reject or revise the time allowed to complete Level 2 ERA Implementation Extensions, (2) identify additional tasks necessary to complete the Level 2 ERA Technical Report, and/or (3) require the Discharger to implement additional temporary BMPs.

**XIII. INACTIVE MINING OPERATION CERTIFICATION**

- A.** Inactive mining operations are defined in Part 3 of Attachment A of this General Permit. The Discharger may, in lieu of complying with the General Permit requirements described in subsection B below, certify and submit via SMARTS that their inactive mining operation meets the following conditions:
  - 1. The Discharger has determined and justified in the SWPPP that it is impracticable to implement the monitoring requirements in this General Permit for the inactive mining operation;
  - 2. A SWPPP has been signed (wet signature and license number) by a California licensed professional engineer and is being implemented in accordance with the requirements of this General Permit; and,
  - 3. The facility is in compliance with this General Permit, except as provided in subsection B below.
- B.** The Discharger who has certified and submitted that they meet the conditions in subsection A above, are not subject to the following General Permit requirements:
  - 1. Monitoring Implementation Plan in Section X.I;
  - 2. Monitoring Requirements in Section XI;
  - 3. Exceedance Response Actions (ERAs) in Section XII; and,
  - 4. Annual Report Requirements in Section XVI.
- C.** Inactive Mining Operation Certification Submittal Schedule
  - 1. The Discharger shall certify and submit via SMARTS NOI coverage PRDs listed in Section II.B.1 and meet the conditions in subsection A above.
  - 2. The Discharger shall annually inspect the inactive mining site and certify via SMARTS no later than July 15th of each reporting year, that their inactive mining operation continues to meet the conditions in subsection A above.

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3. The Discharger shall have a California licensed professional engineer review and update the SWPPP if there are changes to their inactive mining operation or additional BMPs are needed to comply with this General Permit. Any significant updates to the SWPPP shall be signed (wet signature and license number) by a California license professional engineer.
4. The Discharger shall certify and submit via SMARTS any significantly revised SWPPP within 30 days of the revision(s).

### **XIV. COMPLIANCE GROUPS AND COMPLIANCE GROUP LEADERS**

#### **A. Compliance Group Qualification Requirements**

1. Any group of Dischargers of the same industry type or any QISP representing Dischargers of the same industry type may form a Compliance Group. A Compliance Group shall consist of Dischargers that operate facilities with similar types of industrial activities, pollutant sources, and pollutant characteristics (e.g., scrap metals recyclers would join a different group than paper recyclers, truck vehicle maintenance facilities would join a different group than airplane vehicle maintenance facilities, etc.). A Discharger participating in a Compliance Group is termed a Compliance Group Participant. Participation in a Compliance Group is not required. Compliance Groups may be formed at any time.
2. Each Compliance Group shall have a Compliance Group Leader.
3. To establish a Compliance Group, the Compliance Group Leader shall register as a Compliance Group Leader via SMARTS. The registration shall include documentation demonstrating compliance with the Compliance Group qualification requirements above and a list of the Compliance Group Participants.
4. Each Compliance Group Participant shall register as a member of an established Compliance Group via SMARTS.
5. The Executive Director of the State Water Board may review Compliance Group registrations and/or activities for compliance with the requirements of this General Permit. The Executive Director may reject the Compliance Group, the Compliance Group Leader, or individual Compliance Group Participants within the Compliance Group.

#### **B. Compliance Group Leader Responsibilities**

1. A Compliance Group Leader must complete a State Water Board sponsored or approved training program for Compliance Group Leaders.
2. The Compliance Group Leader shall assist Compliance Group Participants with all compliance activities required by this General Permit.

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3. A Compliance Group Leader shall prepare a Consolidated Level 1 ERA Report for all Compliance Group Participants with Level 1 status for the same parameter. Compliance Group Participants who certify and submit these Consolidated Level 1 ERA Reports are subject to the same provisions as individual Dischargers with Level 1 status, as described in Section XII.C. A Consolidated Level 1 ERA Report is equivalent to a Level 1 ERA Report.
4. The Compliance Group Leader shall update the Consolidated Level 1 ERA Report as needed to address additional Compliance Group Participants with ERA Level 1 status.
5. A Compliance Group Leader shall prepare a Level 2 ERA Action Plan specific to each Compliance Group Participant with Level 2 status. Compliance Group Participants who certify and submit these Level 2 ERA Action Plans are subject to the same provisions as individual Dischargers with Level 2 status, as described in Section XII.D.
6. A Compliance Group Leader shall prepare a Level 2 ERA Technical Report specific to each Compliance Group Participant with Level 2 status. Compliance Group Participants who certify and submit these Level 2 ERA Technical Reports are subject to the same provisions as individual Dischargers with Level 2 status, as described in Section XII.D.
7. The Compliance Group Leader shall inspect all the facilities of the Compliance Group Participants that have entered Level 2 status prior to preparing the individual Level 2 ERA Technical Report.
8. The Compliance Group Leader shall revise the Consolidated Level 1 ERA Report, individual Level 2 ERA Action Plans, or individual Level 2 Technical Reports in accordance with any comments received from the Water Boards.
9. The Compliance Group Leader shall inspect all the facilities of the Compliance Group Participants at a minimum of once per reporting year (July 1 to June 30).

### **C. Compliance Group Participant Responsibilities**

1. Each Compliance Group Participant is responsible for permit compliance for the Compliance Group Participant's facility and for ensuring that the Compliance Group Leader's activities related to the Compliance Group Participant's facility comply with this General Permit.
2. Compliance Group Participants with Level 1 status shall certify and submit via SMARTS the Consolidated Level 1 ERA Report. The Compliance Group Participants shall certify that they have reviewed the Consolidated Level 1 ERA Report and have implemented any required additional BMPs. Alternatively, the Compliance Group Participant may submit an individual Level 1 ERA Report in accordance with the provisions in Section XII.C.2.

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3. Compliance Group Participants with Level 2 status shall certify and submit via SMARTS their individual Level 2 ERA Action Plan and Technical Report prepared by their Compliance Group Leader. Each Compliance Group Participant shall certify that they have reviewed the Level 2 ERA Action Plan and Technical Report and will implement any required additional BMPs.
4. Compliance Group Participants can at any time discontinue their participation in their associated Compliance Group via SMARTS. Upon discontinuation, the former Compliance Group Participant is immediately subject to the sampling and analysis requirements described in Section XI.B.2.

**XV. ANNUAL COMPREHENSIVE FACILITY COMPLIANCE EVALUATION (ANNUAL EVALUATION)**

The Discharger shall conduct one Annual Evaluation for each reporting year (July 1 to June 30). If the Discharger conducts an Annual Evaluation fewer than eight (8) months, or more than sixteen (16) months, after it conducts the previous Annual Evaluation, it shall document the justification for doing so. The Discharger shall revise the SWPPP, as appropriate, and implement the revisions within 90 days of the Annual Evaluation. At a minimum, Annual Evaluations shall consist of:

- A. A review of all sampling, visual observation, and inspection records conducted during the previous reporting year;
- B. An inspection of all areas of industrial activity and associated potential pollutant sources for evidence of, or the potential for, pollutants entering the storm water conveyance system;
- C. An inspection of all drainage areas previously identified as having no exposure to industrial activities and materials in accordance with the definitions in Section XVII;
- D. An inspection of equipment needed to implement the BMPs;
- E. An inspection of any BMPs;
- F. A review and effectiveness assessment of all BMPs for each area of industrial activity and associated potential pollutant sources to determine if the BMPs are properly designed, implemented, and are effective in reducing and preventing pollutants in industrial storm water discharges and authorized NSWDS; and,
- G. An assessment of any other factors needed to comply with the requirements in Section XVI.B.

**XVI. ANNUAL REPORT**

- A. The Discharger shall certify and submit via SMARTS an Annual Report no later than July 15<sup>th</sup> following each reporting year using the standardized format and checklists in SMARTS.

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**B. The Discharger shall include in the Annual Report:**

1. A Compliance Checklist that indicates whether a Discharger complies with, and has addressed all applicable requirements of this General Permit;
2. An explanation for any non-compliance of requirements within the reporting year, as indicated in the Compliance Checklist;
3. An identification, including page numbers and/or sections, of all revisions made to the SWPPP within the reporting year; and,
4. The date(s) of the Annual Evaluation.

**XVII. CONDITIONAL EXCLUSION - NO EXPOSURE CERTIFICATION (NEC)**

**A. Discharges composed entirely of storm water that has not been exposed to industrial activity are not industrial storm water discharges. Dischargers are conditionally excluded from complying with the SWPPP and monitoring requirements of this General Permit if all of the following conditions are met:**

1. There is no exposure of Industrial Materials and Activities to rain, snow, snowmelt, and/or runoff;
2. All unauthorized NSWDS have been eliminated and all authorized NSWDS meet the conditions of Section IV;
3. The Discharger has certified and submitted via SMARTS PRDs for NEC coverage pursuant to the instructions in Section II.B.2; and,
4. The Discharger has satisfied all other requirements of this Section.

**B. NEC Specific Definitions**

1. No Exposure - all Industrial Materials and Activities are protected by a Storm-Resistant Shelter to prevent all exposure to rain, snow, snowmelt, and/or runoff.
2. Industrial Materials and Activities - includes, but is not limited to, industrial material handling activities or equipment, machinery, raw materials, intermediate products, by-products, final products, and waste products.
3. Material Handling Activities - includes the storage, loading and unloading, transportation, or conveyance of any industrial raw material, intermediate product, final product, or waste product.
4. Sealed - banded or otherwise secured, and without operational taps or valves.
5. Storm-Resistant Shelters - includes completely roofed and walled buildings or structures. Also includes structures with only a top cover supported by



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permanent supports but with no side coverings, provided material within the structure is not subject to wind dispersion (sawdust, powders, etc.), or track-out, and there is no storm water discharged from within the structure that comes into contact with any materials.

**C. NEC Qualifications**

To qualify for an NEC, a Discharger shall:

1. Except as provided in subsection D below, provide a Storm-Resistant Shelter to protect Industrial Materials and Activities from exposure to rain, snow, snowmelt, run-on, and runoff;
2. Inspect and evaluate the facility annually to determine that storm water exposed to industrial materials or equipment has not and will not be discharged to waters of the United States. Evaluation records shall be maintained for five (5) years in accordance with Section XXI.J.4;
3. Register for NEC coverage by certifying that there are no discharges of storm water contaminated by exposure to Industrial Materials and Activities from areas of the facility subject to this General Permit, and certify that all unauthorized NSWDS have been eliminated and all authorized NSWDS meet the conditions of Section IV (Authorized NSWDS). NEC coverage and annual renewal requires payment of an annual fee in accordance with California Code of Regulations, title 23, section 2200 et seq.; and,
4. Submit PRDs for NEC coverage shall be prepared and submitted in accordance with the:
  - a. Certification requirements in Section XXI.K; and,
  - b. Submittal schedule in accordance with Section II.B.2.

**D. NEC Industrial Materials and Activities - Storm-Resistant Shelter Not Required**

To qualify for NEC coverage, a Storm-Resistant Shelter is not required for the following:

1. Drums, barrels, tanks, and similar containers that are tightly Sealed, provided those containers are not deteriorated, do not contain residual industrial materials on the outside surfaces, and do not leak;
2. Adequately maintained vehicles used in material handling;
3. Final products, other than products that would be mobilized in storm water discharge (e.g., rock salt);

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4. Any Industrial Materials and Activities that are protected by a temporary shelter for a period of no more than ninety (90) days due to facility construction or remodeling; and,
5. Any Industrial Materials and Activities that are protected within a secondary containment structure that will not discharge storm water to waters of the United States.

### E. NEC Limitations

1. NEC coverage is available on a facility-wide basis only, not for individual outfalls. If a facility has industrial storm water discharges from one or more drainage areas that require NOI coverage, Dischargers shall register for NOI coverage for the entire facility through SMARTS in accordance with Section II.B.2. Any drainage areas on that facility that would otherwise qualify for NEC coverage may be specially addressed in the facility SWPPP by including an NEC Checklist and a certification statement demonstrating that those drainage areas of the facility have been evaluated; and that none of the Industrial Materials or Activities listed in subsection C above are, or will be in the foreseeable future, exposed to precipitation.
2. If circumstances change and Industrial Materials and Activities become exposed to rain, snow, snowmelt, and/or runoff, the conditions for this exclusion shall no longer apply. In such cases, the Discharger may be subject to enforcement for discharging without a permit. A Discharger with NEC coverage that anticipates changes in circumstances should register for NOI coverage at least seven (7) days before anticipated exposure.
3. The Regional Water Board may deny NEC coverage and require NOI coverage upon determining that:
  - a. Storm water is exposed to Industrial Materials and Activities; and/or
  - b. The discharge has a reasonable potential to cause or contribute to an exceedance of an applicable water quality standards.

### F. NEC Permit Registration Documents Required for Initial NEC Coverage

A Discharger shall submit via SMARTS the following PRDs for NEC coverage to document the applicability of the conditional exclusion:

1. The NEC form, which includes:
  - a. The legal name, postal address, telephone number, and e-mail address of the Discharger;
  - b. The facility business name and physical mailing address, the county name, and a description of the facility location if the facility does not have a physical mailing address; and,

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- c. Certification by the Discharger that all PRDs submitted are correct and true and the conditions of no exposure have been met.
2. An NEC Checklist prepared by the Discharger demonstrating that the facility has been evaluated; and that none of the following industrial materials or activities are, or will be in the foreseeable future, exposed to precipitation:
  - a. Using, storing or cleaning industrial machinery or equipment, and areas where residuals from using, storing or cleaning industrial machinery or equipment remain and are exposed;
  - b. Materials or residuals on the ground or in storm water inlets from spills/leaks;
  - c. Materials or products from past industrial activity;
  - d. Material handling equipment (except adequately maintained vehicles);
  - e. Materials or products during loading/unloading or transporting activities;
  - f. Materials or products stored outdoors (except final products intended for outside use, e.g., new cars, where exposure to storm water does not result in the discharge of pollutants);
  - g. Materials contained in open, deteriorated or leaking storage drums, barrels, tanks, and similar containers;
  - h. Materials or products handled/stored on roads or railways owned or maintained by the Discharger;
  - i. Waste material (except waste in covered, non-leaking containers, e.g., dumpsters);
  - j. Application or disposal of processed wastewater (unless already covered by an NPDES permit); and,
  - k. Particulate matter or visible deposits of residuals from roof stacks/vents evident in the storm water outflow.
3. Site Map (see Section X.E).

**G. Requirements for Annual NEC Coverage Recertification**

By October 1 of each reporting year beginning in 2015, any Discharger who has previously registered for NEC coverage shall either submit and certify an NEC demonstrating that the facility has been evaluated, and that none of the Industrial Materials or Activities listed above are, or will be in the foreseeable future, exposed to precipitation, or apply for NOI coverage.

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All NEC certifications and re-certifications shall include the following certification statement:

*I certify under penalty of law that I have read and understand the eligibility requirements for claiming a condition of 'no exposure' and obtaining an exclusion from NPDES storm water permitting; and that there are no discharges of storm water contaminated by exposure to industrial activities or materials from the industrial facility identified in this document (except as allowed in subsection C above). I understand that I am obligated to submit a no exposure certification form annually to the State Water Board and, if requested, to the operator of the local Municipal Separate Storm Sewer System (MS4) into which this facility discharges (where applicable). I understand that I must allow the Water Board staff, or MS4 operator where the discharge is into the local MS4, to perform inspections to confirm the condition of no exposure and to make such inspection reports publicly available upon request. I understand that I must obtain coverage under an NPDES permit prior to any point source discharge of storm water from the facility. I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based upon my inquiry of the person or persons who manage the system, or those persons directly involved in gathering the information, the information submitted is to the best of my knowledge and belief true, accurate and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.*

**XVIII.SPECIAL REQUIREMENTS - PLASTIC MATERIALS**

**A.** Facilities covered under this General Permit that handle Plastic Materials are required to implement BMPs to eliminate discharges of plastic in storm water in addition to the other requirements of this General Permit that are applicable to all other Industrial Materials and Activities. Plastic Materials are virgin and recycled plastic resin pellets, powders, flakes, powdered additives, regrind, dust, and other similar types of preproduction plastics with the potential to discharge or migrate off-site. Any Dischargers' facility handling Plastic Materials will be referred to as Plastics Facilities in this General Permit. Any Plastics Facility covered under this General Permit that manufactures, transports, stores, or consumes these materials shall submit information to the State Water Board in their PRDs, including the type and form of plastics, and which BMPs are implemented at the facility to prevent illicit discharges. Pursuant to Water Code section 13367, Plastics Facilities are subject to mandatory, minimum BMPs.

1. At a minimum, Plastics Facilities shall implement and include in the SWPPP:
  - a. Containment systems at each on-site storm drain discharge location down gradient of areas containing plastic material. The containment system

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shall be designed to trap all particles retained by a 1mm mesh screen, with a treatment capacity of no less than the peak flow rate from a one-year, one-hour storm.

- b. When a containment system is infeasible, or poses the potential to cause an illicit discharge, the facility may propose a technically feasible alternative BMP or suite of BMPs. The alternative BMPs shall be designed to achieve the same or better performance standard as a 1mm mesh screen with a treatment capacity of the peak flow rate from a one-year, one-hour storm. Alternative BMPs shall be submitted to the Regional Water Board for approval.
  - c. Plastics Facilities shall use durable sealed containers designed not to rupture under typical loading and unloading activities at all points of plastic transfer and storage.
  - d. Plastics Facilities shall use capture devices as a form of secondary containment during transfers, loading, or unloading Plastic Materials. Examples of capture devices for secondary containment include, but are not limited to catch pans, tarps, berms or any other device that collects errant material.
  - e. Plastics Facilities shall have a vacuum or vacuum-type system for quick cleanup of fugitive plastic material available for employees.
  - f. Pursuant to Water Code section 13367(e)(1), Plastics Facilities that handle Plastic Materials smaller than 1mm in size shall develop a containment system designed to trap the smallest plastic material handled at the facility with a treatment capacity of at least the peak flow rate from a one-year, one-hour storm, or develop a feasible alternative BMP or suite of BMPs that are designed to achieve a similar or better performance standard that shall be submitted to the Regional Water Board for approval.
2. Plastics Facilities are exempt from the Water Code requirement to install a containment system under section 13367 of the Water Code if they meet one of the following requirements that are determined to be equal to, or exceed the performance requirements of a containment system:
    - a. The Discharger has certified and submitted via SMARTS a valid No Exposure Certification (NEC) in accordance with Section XVII; or
    - b. Plastics Facilities are exempt from installing a containment system, if the following suite of eight (8) BMPs is implemented. This combination of BMPs is considered to reduce or prevent the discharge of plastics at a performance level equivalent to or better than the 1mm mesh and flow standard in Water Code section 13367(e)(1).
      - i. Plastics Facilities shall annually train employees handling Plastic Materials. Training shall include environmental hazards of plastic

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discharges, employee responsibility for corrective actions to prevent errant Plastic Materials, and standard procedures for containing, cleaning, and disposing of errant Plastic Materials.

- ii. Plastics Facilities shall immediately fix any Plastic Materials containers that are punctured or leaking and shall clean up any errant material in a timely manner.
- iii. Plastics Facilities shall manage outdoor waste disposal of Plastic Materials in a manner that prevents the materials from leaking from waste disposal containers or during waste hauling.
- iv. Plastics Facilities that operate outdoor conveyance systems for Plastic Materials shall maintain the system in good operating condition. The system shall be sealed or filtered in such a way as to prevent the escape of materials when in operation. When not in operation, all connection points shall be sealed, capped, or filtered so as to not allow material to escape. Employees operating the conveyance system shall be trained how to operate in a manner that prevents the loss of materials such as secondary containment, immediate spill response, and checks to ensure the system is empty during connection changes.
- v. Plastics Facilities that maintain outdoor storage of Plastic Materials shall do so in a durable, permanent structure that prevents exposure to weather that could cause the material to migrate or discharge in storm water.
- vi. Plastics Facilities shall maintain a schedule for regular housekeeping and routine inspection for errant Plastic Materials. The Plastics Facility shall ensure that their employees follow the schedule.
- vii. PRDs shall include the housekeeping and routine inspection schedule, spill response and prevention procedures, and employee training materials regarding plastic material handling.
- viii. Plastics Facilities shall correct any deficiencies in the employment of the above BMPs that result in errant Plastic Materials that may discharge or migrate off-site in a timely manner. Any Plastic Materials that are discharged or that migrate off-site constitute an illicit discharge in violation of this General Permit.

**XIX. REGIONAL WATER BOARD AUTHORITIES**

- A. The Regional Water Boards may review a Discharger's PRDs for NOI or NEC coverage and administratively reject General Permit coverage if the PRDs are deemed incomplete. The Regional Water Boards may take actions that include rescinding General Permit coverage, requiring a Discharger to revise and re-submit their PRDs (certified and submitted by the Discharger) within a



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specified time period, requiring the Discharger to apply for different General Permit coverage or a different individual or general permit, or taking no action.

- B.** The Regional Water Boards have the authority to enforce the provisions and requirements of this General Permit. This includes, but is not limited to, reviewing SWPPPs, Monitoring Implementation Plans, ERA Reports, and Annual Reports, conducting compliance inspections, and taking enforcement actions.
- C.** As appropriate, the Regional Water Boards may issue NPDES storm water general or individual permits to a Discharger, categories of Dischargers, or Dischargers within a watershed or geographic area. Upon issuance of such NPDES permits, this General Permit shall no longer regulate the affected Discharger(s).
- D.** The Regional Water Boards may require a Discharger to revise its SWPPP, ERA Reports, or monitoring programs to achieve compliance with this General Permit. In this case, the Discharger shall implement these revisions in accordance with a schedule provided by the Regional Water Board.
- E.** The Regional Water Boards may approve requests from a Discharger to include co-located, but discontinuous, industrial activities within the same facility under a single NOI or NEC coverage.
- F.** Consistent with 40 Code of Federal Regulations section 122.26(a)(9)(i)(D), the Regional Water Boards may require any discharge that is not regulated by this General Permit, that is determined to contribute to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States, to be covered under this General Permit as appropriate. Upon designation, the Discharger responsible for the discharge shall obtain coverage under this General Permit.
- G.** The Regional Water Boards may review a Discharger's Inactive Mining Operation Certification and reject it at any time if the Regional Water Board determines that access to the facility for monitoring purposes is practicable or that the facility is not in compliance with the applicable requirements of this General Permit.
- H.** The Regional Water Boards may require a Discharger to implement additional measures including, but not limited to, assigning a QISP to re-evaluate the facility's pollutant source assessment to ensure compliance with TMDL-related requirements in this General Permit.
- I.** All Regional Water Board actions that modify a Discharger's obligations under this General Permit must be in writing and should also be submitted in SMARTS.

**XX. SPECIAL CONDITIONS****A. Reopener Clause**

This General Permit may be reopened and amended to incorporate TMDL-related provisions. This General Permit may also be modified, revoked and

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reissued, or terminated for cause due to promulgation of amended regulations, water quality control plans or water quality control policies, receipt of U.S. EPA guidance concerning regulated activities, judicial decision, or in accordance with 40 Code of Federal Regulations sections 122.62, 122.63, 122.64, and 124.5.

**B. Water Quality Based Corrective Actions**

1. Upon determination by the Discharger or written notification by the Regional Water Board that industrial storm water discharges and/or authorized NSWDS contain pollutants that are in violation of Receiving Water Limitations (Section VI) or in the event that a Responsible Discharger's industrial storm water discharge exceeds an NEL in Attachment E, the Discharger shall:
  - a. Conduct a facility evaluation to identify pollutant source(s) within the facility that are associated with industrial activity and whether the BMPs described in the SWPPP have been properly implemented;
  - b. Assess the facility's SWPPP and its implementation to determine whether additional BMPs or SWPPP implementation measures are necessary to reduce or prevent pollutants in industrial storm water discharges to meet the Receiving Water Limitations (Section VI); and,
  - c. Certify and submit via SMARTS documentation based upon the above facility evaluation and assessment that:
    - i. Additional BMPs and/or SWPPP implementation measures have been identified and included in the SWPPP to meet the Receiving Water Limitations (Section VI) or applicable NELs (Attachment E); or
    - ii. No additional BMPs or SWPPP implementation measures are required to reduce or prevent pollutants in industrial storm water discharges to meet the Receiving Water Limitations (Section VI) or applicable NELs (Attachment E).
2. The Regional Water Board may reject the Dischargers water quality based corrective actions and/or request additional supporting documentation.

**C. Requirements for Dischargers Claiming "No Discharge" through the Notice of Non-Applicability (NONA)**

1. For the purpose of the NONA, the Entity (Entities) is referring to the person(s) defined in section 13399.30 of the Water Code.
2. Entities who are claiming "No Discharge" through the NONA shall meet the following eligibility requirements:
  - a. The facility is engineered and constructed to have contained the maximum historic precipitation event (or series of events) using the precipitation data collected from the National Oceanic and Atmospheric Agency's website (or other nearby precipitation data available from other government

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agencies) so that there will be no discharge of industrial storm water to waters of the United States; or,

- b. The facility is located in basins or other physical locations that are not hydrologically connected to waters of the United States.
3. When claiming the “No Discharge” option, Entities shall submit and certify via SMARTS both the NONA and a No Discharge Technical Report. The No Discharge Technical Report shall demonstrate the facility meets the eligibility requirements described above.
4. The No Discharge Technical Report shall be signed (wet signature and license number) by a California licensed professional engineer.

## **XXI. STANDARD CONDITIONS**

### **A. Duty to Comply**

Dischargers shall comply with all standard conditions in this General Permit. Permit noncompliance constitutes a violation of the Clean Water Act and the Water Code and is grounds for enforcement action and/or removal from General Permit coverage.

Dischargers shall comply with effluent standards or prohibitions established under section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions.

### **B. Duty to Reapply**

Dischargers that wish to continue an activity regulated under this General Permit after the expiration date of this General Permit shall apply for and obtain authorization from the Water Boards as required by the new general permit once it is issued.

### **C. General Permit Actions**

1. This General Permit may be modified, revoked and reissued, or terminated for cause. Submittal of a request by the Discharger for General Permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not annul any General Permit condition.
2. If a toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under section 307(a) of the Clean Water Act for a toxic pollutant which is present in the discharge, and that standard or prohibition is more stringent than any limitation on the pollutant in this General Permit, this General Permit shall be modified or revoked and reissued to conform to the toxic effluent standard or prohibition.

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### **D. Need to Halt or Reduce Activity Not a Defense**

In an enforcement action, it shall not be a defense for a Discharger that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this General Permit.

### **E. Duty to Mitigate**

Dischargers shall take all responsible steps to reduce or prevent any discharge that has a reasonable likelihood of adversely affecting human health or the environment.

### **F. Proper Operation and Maintenance**

Dischargers shall at all times properly operate and maintain any facilities and systems of treatment and control (and related equipment and apparatuses) which are installed or used by the Discharger to achieve compliance with the conditions of this General Permit. Proper operation and maintenance also include adequate laboratory controls and appropriate quality assurance procedures. Proper operation and maintenance may require the operation of backup or auxiliary facilities or similar systems installed by a Discharger when necessary to achieve compliance with the conditions of this General Permit.

### **G. Property Rights**

This General Permit does not convey any property rights of any sort or any exclusive privileges. It also does not authorize any injury to private property or any invasion of personal rights, nor does it authorize any infringement of federal, state, or local laws and regulations.

### **H. Duty to Provide Information**

Upon request by the relevant agency, Dischargers shall provide information to determine compliance with this General Permit to the Water Boards, U.S. EPA, or local Municipal Separate Storm Sewer System (MS4) within a reasonable time. Dischargers shall also furnish, upon request by the relevant agency, copies of records that are required to be kept by this General Permit.

### **I. Inspection and Entry**

Dischargers shall allow the Water Boards, U.S. EPA, and local MS4 (including any authorized contractor acting as their representative), to:

1. Enter upon the premises at reasonable times where a regulated industrial activity is being conducted or where records are kept under the conditions of this General Permit;
2. Access and copy at reasonable times any records that must be kept under the conditions of this General Permit;

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3. Inspect the facility at reasonable times; and,
4. Sample or monitor at reasonable times for the purpose of ensuring General Permit compliance.

### **J. Monitoring and Records**

1. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.
2. If Dischargers monitor any pollutant more frequently than required, the results of such monitoring shall be included in the calculation and reporting of the data submitted.
3. Records of monitoring information shall include:
  - a. The date, exact location, and time of sampling or measurement;
  - b. The date(s) analyses were performed;
  - c. The individual(s) that performed the analyses;
  - d. The analytical techniques or methods used; and,
  - e. The results of such analyses.
4. Dischargers shall retain, for a period of at least five (5) years, either a paper or electronic copy of all storm water monitoring information, records, data, and reports required by this General Permit. Copies shall be available for review by the Water Board's staff at the facility during scheduled facility operating hours.
5. Upon written request by U.S. EPA or the local MS4, Dischargers shall provide paper or electronic copies of Annual Reports or other requested records to the Water Boards, U.S. EPA, or local MS4 within ten (10) days from receipt of the request.

### **K. Electronic Signature and Certification Requirements**

1. All Permit Registration Documents (PRDs) for NOI and NEC coverage shall be certified and submitted via SMARTS by the Discharger's Legally Responsible Person (LRP). All other documents may be certified and submitted via SMARTS by the LRP or by their designated Duly Authorized Representative.
2. When a new LRP or Duly Authorized Representative is designated, the Discharger shall ensure that the appropriate revisions are made via SMARTS. In unexpected or emergency situations, it may be necessary for the Discharger to directly contact the State Water Board's Storm Water Section to register for SMARTS account access in order to designate a new LRP.

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3. Documents certified and submitted via SMARTS by an unauthorized or ineligible LRP or Duly Authorized Representative are invalid.
4. LRP eligibility is as follows:
  - a. For a corporation: by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:
    - i. A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function; or
    - ii. The manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
  - b. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively;
  - c. For a municipality, state, federal, or other public agency: by either a principal executive officer or ranking elected official. This includes the chief executive officer of the agency or the senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of U.S. EPA).
5. Duly Authorized Representative eligibility is as follows:
  - a. The Discharger must authorize via SMARTS any person designated as a Duly Authorized Representative;
  - b. The authorization shall specify that a person designated as a Duly Authorized Representative has responsibility for the overall operation of the regulated facility or activity, such as a person that is a manager, operator, superintendent, or another position of equivalent responsibility, or is an individual who has overall responsibility for environmental matters for the company; and,
  - c. The authorization must be current (it has been updated to reflect a different individual or position) prior to any report submittals, certifications, or records certified by the Duly Authorized Representative.



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**L. Certification**

Any person signing, certifying, and submitting documents under Section XXI.K above shall make the following certification:

*I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons that manage the system or those persons directly responsible for gathering the information, to the best of my knowledge and belief, the information submitted is, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.*

**M. Anticipated Noncompliance**

Dischargers shall give advance notice to the Regional Water Board and local MS4 of any planned changes in the industrial activity that may result in noncompliance with this General Permit.

**N. Penalties for Falsification of Reports**

Clean Water Act section 309(c)(4) provides that any person that knowingly makes any false material statement, representation, or certification in any record or other document submitted or required to be maintained under this General Permit, including reports of compliance or noncompliance shall upon conviction, be punished by a fine of not more than \$10,000 or by imprisonment for not more than two years or by both.

**O. Oil and Hazardous Substance Liability**

Nothing in this General Permit shall be construed to preclude the initiation of any legal action or relieve the Discharger from any responsibilities, liabilities, or penalties to which the Discharger is or may be subject to under section 311 of the Clean Water Act.

**P. Severability**

The provisions of this General Permit are severable; if any provision of this General Permit or the application of any provision of this General Permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this General Permit shall not be affected thereby.

**Q. Penalties for Violations of Permit Conditions**

1. Clean Water Act section 309 provides significant penalties for any person that violates a permit condition implementing sections 301, 302, 306, 307, 308, 318, or 405 of the Clean Water Act or any permit condition or limitation

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implementing any such section in a permit issued under section 402. Any person that violates any permit condition of this General Permit is subject to a civil penalty not to exceed \$37,500<sup>28</sup> per calendar day of such violation, as well as any other appropriate sanction provided by section 309 of the Clean Water Act.

2. The Porter-Cologne Water Quality Control Act also provides for civil and criminal penalties, which may be greater than penalties under the Clean Water Act.

### **R. Transfers**

Coverage under this General Permit is non-transferrable. When operation of the facility has been transferred to another entity, or a facility is relocated, new PRDs for NOI and NEC coverage must be certified and submitted via SMARTS prior to the transfer, or at least seven (7) days prior to the first day of operations for a relocated facility.

### **S. Continuation of Expired General Permit**

If this General Permit is not reissued or replaced prior to the expiration date, it will be administratively continued in accordance with 40 Code of Federal Regulations 122.6 and remain in full force and effect.

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<sup>28</sup> May be further adjusted in accordance with the Federal Civil Penalties Inflation Adjustment Act.